

"GREAT" LAKE DIVING • PERSONAL SUBMARINE TEST DRIVE



S P O R T

DIVER

THE ULTIMATE UNDERWATER EXPERIENCE

The Red Sea Easier than ever



MIND
CONTROL FOR
BETTER DIVING

CORAL SECRETS

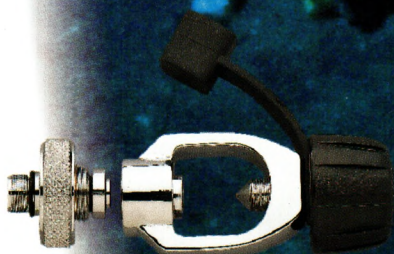
MAY/JUNE 1994
U.S. \$2.95 CAN. \$3.95



E A S Y



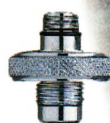
TANKS					
AIR CU. FT.	SERVICE PRESSURE	LITERS	OUTSIDE DIAMETER	HEIGHT	WEIGHT
95	220 bar	12	8.03"	21.85"	47 LBS
120	220 bar	15	8.03"	25.78"	55 LBS
140	220 bar	18	8.03"	29.92"	63 LBS
190	300 bar	18	8.03"	31.29"	87 LBS



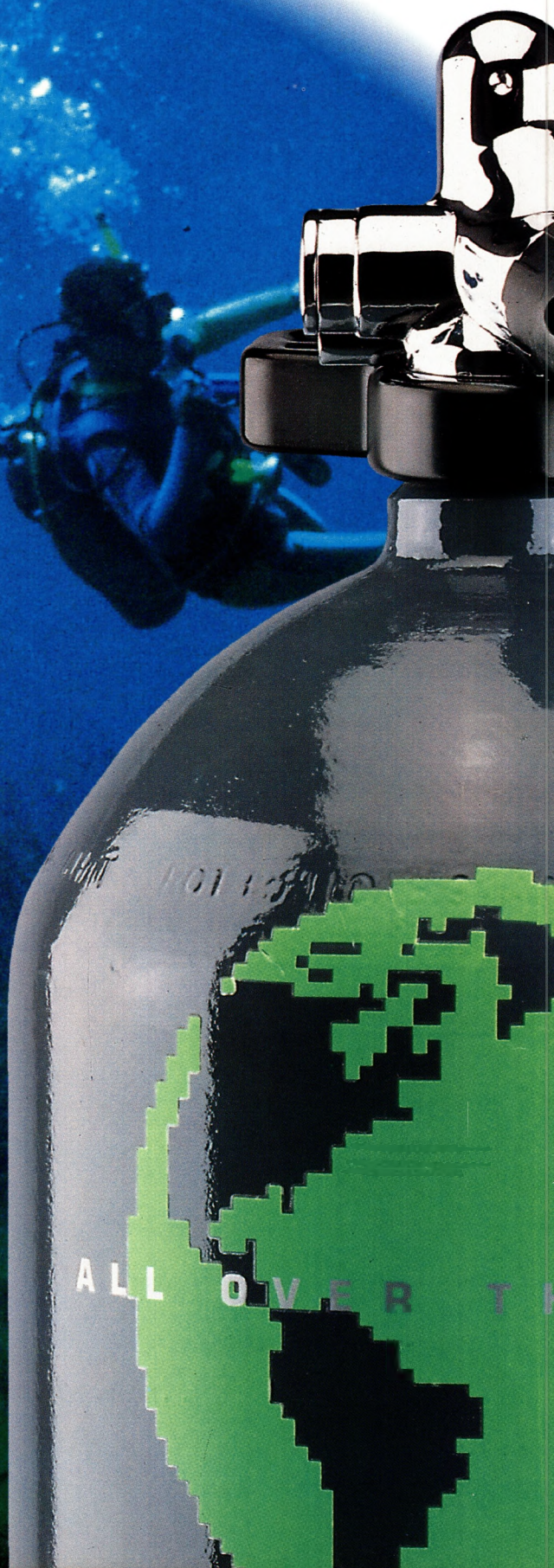
V4/V10
300 b.

V3/V8
200 b.

V4/V10
200 b.



DIN conversion kits.
Allow conversion of INT yoke type regulators to either
200 or 300 BAR DIN system

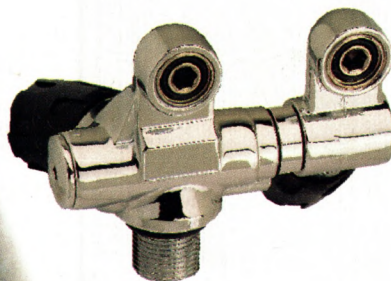


H I R

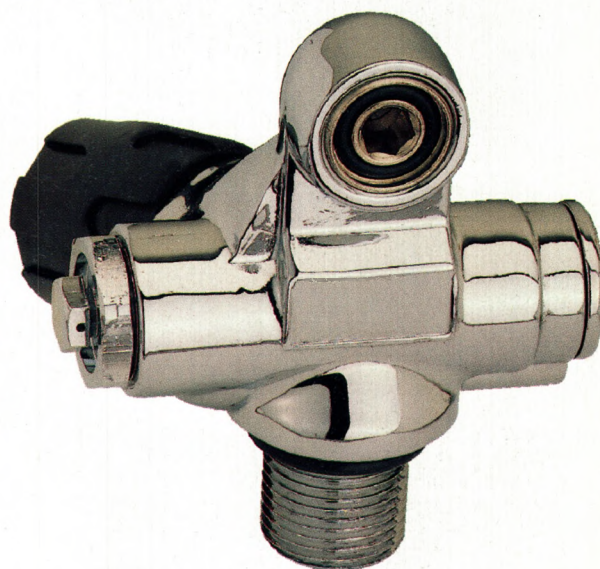
N E W

TANKS & VALVES

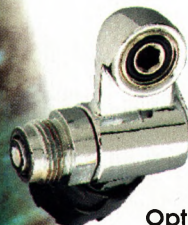
Beuchat's new low profile modular valve system. For use with either DIN or INT conventional mounting. A true modular concept for various applications.



Dual outlet modular valve system with optional swivel outlet for redundant regulator mounting



Double tank modular manifold system with cross/bar handle. Also available with center isolator valve and optional swivel for dual outlet.



Optional modular dual outlet swivel system.

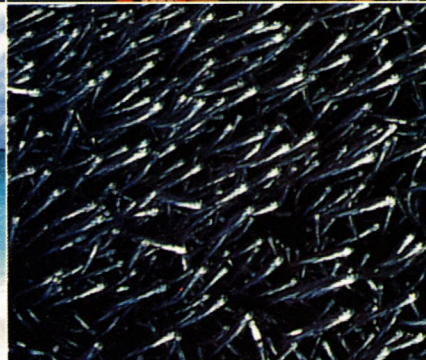
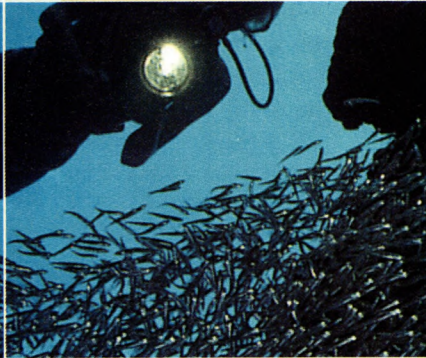
BEUCHAT®



Product Information 58

BEUCHAT USA INC. 1321 NORTH WEST 65th PLACE FORT LAUDERDALE FLORIDA 33309-1964
TEL. (305) 978.1204 / FAX. (305) 978.1207

THE CAYMAN ISLANDS OURS & YOURS



Shallow & deep. Wrecks & walls.
Beginner & advanced.

The choice is yours when
you dive the majestic waters of
The Cayman Islands.

Explore our more than 200 dive
sites teeming with marine life.

Exotic fish. Swaying sea plumes.
Playful stingrays. Shimmering coral.
All flourishing beneath our clear,
protected waters.

Onshore, enjoy golf, tennis,
shopping, sightseeing and the
most charming people in the
British Caribbean.



To fly here on a comfortable
Cayman Airways jet, call your travel
agent or 1-800-G-CAYMAN.
For more information, call
1-800-346-3313.

Come dive Grand Cayman,
Cayman Brac and Little Cayman.
And discover our underwater world
that is safe, spectacular and
yours to share.



"Those who dive us,
love us."

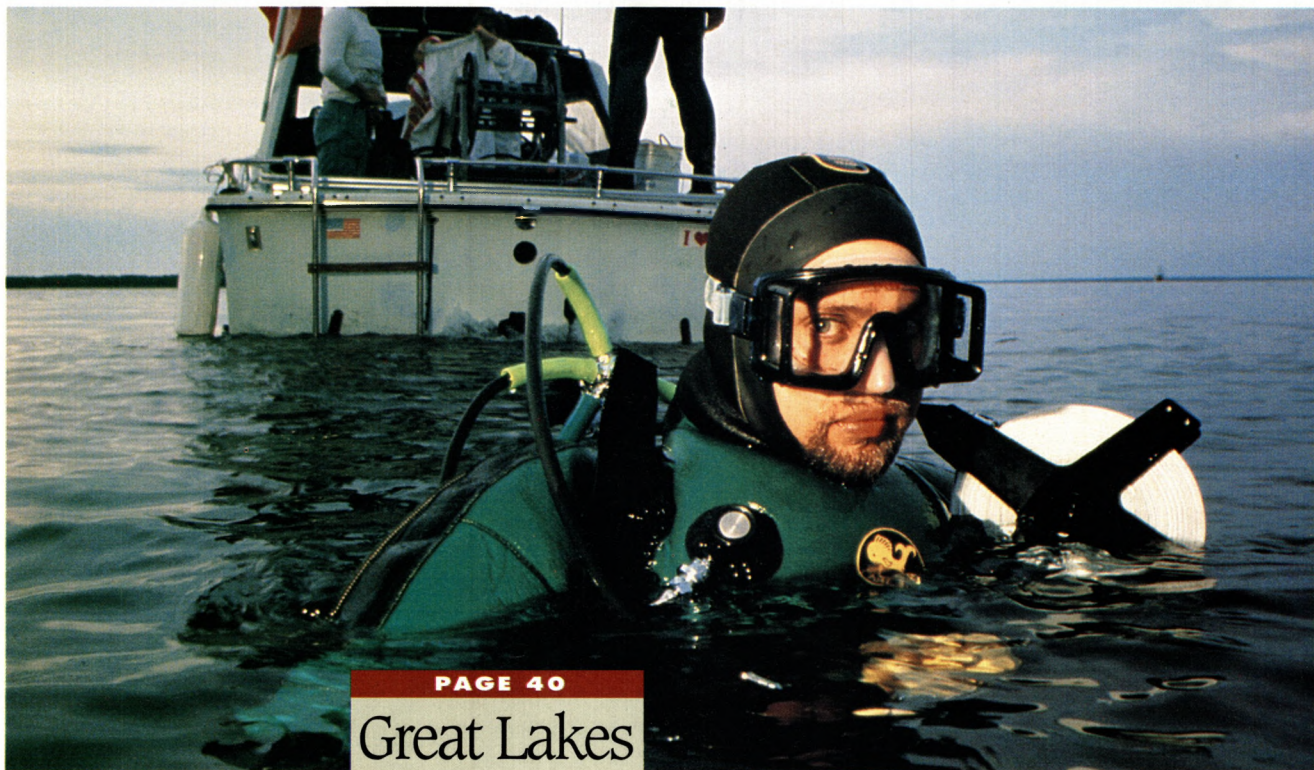


COVER: BRET GILLIAM

SPORT DIVER

M A G A Z I N E

CONTENTS



JOSEPH OLIVER

PAGE 40

Great Lakes

FEATURES

DESTINATION ATLANTIS

Photojournalist Amos Nachoum follows a 727 to the bottom of the sea as it becomes a Miami artificial reef **36**

CORAL SECRETS

Reproduction gets complicated when you're attached to a reef. Doug Perrine explains how stony corals manage to overcome this obstacle..... **48**

OVER THE EDGE

Gary Gentile isn't your average wreck enthusiast. Writer Barb Lander chronicles his quest and the history of the ships he's visited..... **54**

THE MIND GAME

We dive to relax, but task loading and lack of training can cause tension. Tom Mount offers some advice on stress management and improving your diving mindset **62**

RED SEA ADVENTURE

Two correspondents offer their Mid East dive experiences. Eric Hanauer shares some travel tips, attitude adjustments and site suggestions for visiting this exotic destination and Valerie Moore recounts a not-so-perfect, yet memorable live-aboard dive trip..... **68**

With more coastline than any other state and visibility that can approach Caribbean standards, Michigan diving offers an exciting fresh-water experience.

By Tom Morrissey & Jean Pierce

DEPARTMENTS

SEA FACTS Answers to marine science and diving questions... **8**

PHOTO OP. Housed vs. submersible cameras **12**

SKILLS REVIEW Night diving **20**

BOAT DIVER Drift diving from small boats **26**

LEADING EDGE Technical gear configurations..... **30**

TEST DIVE Personal submarines & more **82**

HEAD TO HEAD DIN vs. yoke connections..... **87**

INNOVATIONS American Underwater DPV **89**

JUST SURFACED Medical kits & more **90**

DESTINATIONS Santa Barbara, San Salvador & Panama City **92**

RESORT REPORT Surfside Waterports **101**

NEWS Travel & Industry **103**

DIVE LOG First color photo of a rare fish **106**

SPRING BREAK

BY PIERCE HOOVER

Let's be honest. You're attractive, intelligent, and an above-average diver, so nothing like this has ever happened to you. But it did happen to some buddies of mine recently, so let's learn from them.

Frank and Todd are experienced divers with several hundred log entries apiece. Frank has more specialty cards than an Eagle scout does merit badges, and Todd's working on his divemaster certification.

Last winter, the guys got fed up with all the snow storms and made a road trip to Palm Beach. Drove 20 hours straight through sleet and rain to reach Singer Island by midnight.

They were running late the next morning and barely had time to choke down a sausage biscuit before the boat left. Even though neither had "gotten wet" in six months, they felt pretty good as they went through the familiar motions of gearing up.

Frank pulled his brand-new wetsuit out of the bag — a Christmas gift from his girlfriend. "Better add a couple more pounds of lead," Todd reminded him. "That suit'll be more buoyant."

They bummed a three-pounder from the divemaster, and threaded it onto the weight belt. Frank didn't like to have excess webbing flapping, and he'd cut his belt to fit the buckle with only a couple of inches to spare. Now, with the thicker wetsuit and the extra weight, the buckle was right at the end of the webbing.

Meanwhile, Todd had a problem with his housed camera and went below to open it up. Not usually a guy to "go green behind the gills," the combination of diesel fumes, the long drive, the sausage biscuit and the hot, cramped cabin gave him the cold sweats.

He retreated to the open deck and set the camera on a bench while he collected himself. With a crash, a passing swell and gravity introduced fragile 35mm camera parts to the cockpit sole.

While Todd silently cursed himself

for making such a "rookie mistake," Frank prepared to enter the water. His giant stride was a thing of beauty, but it proved too much for his weight belt. The buckle lost its grip on the shortened webbing, Frank wasn't quite quick enough and the belt plummeted 60 feet to the bottom. He spent an embarrassing few minutes bobbing in the swells while the crew found him a spare.

Back at the dock, the guys were able to laugh about it, and they ended up having a great week of diving (although camera repair bills did cut into their "entertainment" funds). Sometimes, things just go wrong, but my buddies could have avoided their first-day problems with a pre-trip gear check and a warm-up session in an indoor pool.

After a few months off, even the best divers may be a little rusty. Diving may be like riding a bike — you never forget the basics — but many of the subtle skills are more like piloting an airplane: they require regular maintenance and sometimes a little "relearning" after a long break.

Keeping your equipment in top working order is one way to avoid stress and problems, but it's even more important to keep your "internal software" up to speed. Enroll in a specialty course during the off season, join a dive club and keep up on your reading.

If you have the chance, get to a pool, lake or local dive site before you go away on that big trip. A little time underwater can bring back dormant skills, and can flag any potential problem areas — like a wetsuit that no longer fits or an inflator valve that sticks.

After a tune up session, you can hit the road or the airport knowing that not only is your gear up to speed, but so is your diving ability.



S P O R T
DIVER
M A G A Z I N E

Publisher Terry Snow

EDITORIAL DEPARTMENT

Editor Pierce Hoover

Managing Editor Vincent Rhodes

Editorial Assistant Alisa Hood

Contributors

Tom Turner, Andrew Wilson, Doug Dukane, Amos Nachoum, Doug Perrine, Barb Lander, Eric Hanauer, Valerie Moore, Tom Mount, Tom Morrissey, Jean Pierce, Bret Gilliam, Gary Clark, Spence Gilman, Brandon Cole, Pat Canova, Kathy deWet, Bob Sheridan, Richard McEnery, Murray S. Kaufman, Judi Brooks, David Underwood, Brenda Weaver, Norbert Wu, Anne Sophie Pozzoli, Rick Sammon, Rick Heydel, Jesse Cancelmo, Lewis Pavlovich, Bob Brodbeck, David Lohr, Joseph Oliver, Bob Evans, Jim Scheiner, Brad Sheard, Dale Purchase, Louisa Preston, Marty Snyderman

ART DEPARTMENT

Art Director David Weaver

Production Coordinator Tim Jones

Production Manager Lisa Earlywine

ADVERTISING DEPARTMENT

Associate Publisher Susan S. Gilman

407-628-4802

Sales Representatives

Dawn Driggs

407-628-4802

Carin Beaulieu

Florida Keys Office 305-852-7840

Advertising Coordinator Monica Walsh

MARKETING DEPARTMENT

Circulation Manager Sharon Gifford

Customer Service Manager Dena Gise

Circulation Coordinator Sue Whitney

Retail Sales Coordinator Linda Gridler

Product Marketing Manager Jennifer McComb

Market Research Manager Meei Lum

BUSINESS DEPARTMENT

Vice President Dave Freygang

Manager, Accounting Kris Zadrozny

Accounts Receivable Assoc. Tami Tichy-Brooks

Credit Manager Dinah L. Peterson

Human Resource/Office Manager Boni Bruun

Image Assembly

Ewasko's Litho Services, Orlando Florida

Contributions: Editorial comments, articles, photography or art work should be addressed to Editor, P.O. Box 2456, Winter Park, FL 32790. Not responsible for solicited or unsolicited material. Advertisers: UPS and overnight delivery to 330 West Canton Ave., Winter Park, FL 32789. Information and media kits are available by calling (407) 628-4802. For subscription information or questions, call (800) 394-6006.

Sport Diver is published bimonthly by World Publications, Inc. 330 W. Canton Ave., Winter Park, FL 32789-3195. Basic rate \$19.97 for one year, \$36.97 for two years, and \$46.97 for three years. (Canadian residents please add \$10 per year for postage, all other foreign residents please add \$20 for postage, U.S. funds only). Application to mail at Second-Class Postage rate is pending at Winter Park, FL, and additional offices. Contents copyright 1993 by World Publications, Inc.

POSTMASTER: Send address changes to *Sport Diver* Magazine, PO Box 8500, Winter Park, FL 32790. Printed in USA.

Diving Decisions Made Quick, Clear & Easy.



PLANA AVANTI QUATTRO

Mares dramatically improves its revolutionary two Channel Thrust Technology™ with the introduction of the new Four Channel Avanti Quattro Fin. This enhanced technology delivers at least 20% more power than our world famous Plana Avanti. The Avanti Channel Thrust Technology™ maximizes the channeling of water directly behind the fin...where you want it to be. 100% of your effort translates into thrust, speed, and stability, with the most optimum exertion-to-thrust efficiency ratio on the market. Quite simply, the new Avanti Quattro is the quickest and most efficient fin in the world.



ESA MASK

Mares revolutionizes today's underwater vision with the introduction of the world's first six window mask...the ESA. The lower lenses are perfectly angled to allow divers to see their BC pockets, weight belt, and can even be changed out for magnifying positive diopter lenses (like bi-focals) to make gauge reading and photo equipment settings come into "close-up" view. The two front lenses may also be changed out to accommodate your choice of prescription lens. Providing the ultimate in aquatic ambiance, the ESA is clearly the most advanced mask on the market.



SAHARA DRY SNORKEL

Mares' newest snorkel addition was designed as the perfect compliment to our Quattro Fin and ESA Mask. Our patent pending Ball Purge System minimizes the expiration effort to clear the snorkel while allowing dry, unobstructed breathing. The Dry Cap prevents water from splashing into the snorkel when snorkeling. This is undoubtedly the ideal snorkel for beginning and advanced divers alike. The Sahara Dry...the easiest snorkel you will ever use.



4801 North 63rd Street
Boulder, Colorado 80301

Free information circle 79 on reader service card



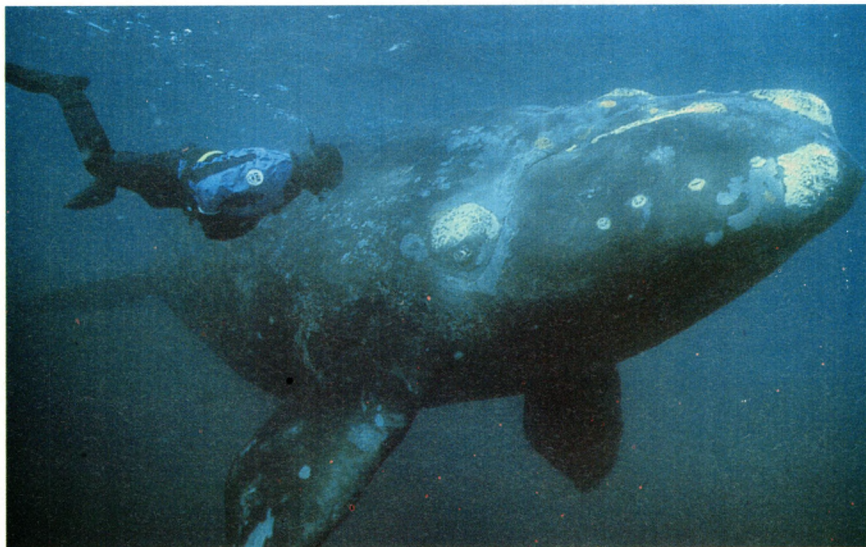
CALL
1-800-874-3236
EXT. 600
FOR AN 18 MINUTE
EQUIPMENT EDUCATION
VIDEO PACKAGE.

Sea Facts

*Marine mammals, mud dwellers,
spur and groove reefs, and sea lice*

WHALES & DIVERS

BY ANDREW WILSON



MARTY SNYDERMAN

The diver cannot be held in violation of marine mammal protections laws if this southern right whale decides to do some "human watching."

Q: Dive magazines always show pictures of divers swimming with whales. I thought there were international laws to prohibit boaters or divers from contacting or harassing marine mammals. Is this true, and if so, are divers in these photos breaking any laws?

A: The United States, along with several other nations, has laws that protect whales from harassment and harm. Many of these can be interpreted as prohibiting diving with whales.

The Marine Mammal Protection Act of 1972 protects all marine mammals (whales, seals, sea lions, walrus and dolphins) from harm or harassment.

The U.S. Endangered Species Act of 1973 goes a step further, providing extra protection to endangered and threatened animals. Section 9 of this act prohibits the "taking" of any endangered species in U.S. territorial waters or by U.S. citizens on the high seas.

"Take" is defined as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or to attempt to engage

in any such conduct." Although diving is not mentioned, going out to dive with a whale could be interpreted as pursuing or harassing it. Violators of this act face fines up to \$20,000 or imprisonment for up to one year.

In addition to federal laws, some states also have protective laws. Hawaii, for example, has regulations that prohibit aircraft from approaching closer than 1,000 feet and prohibit vessels or people from approaching closer than 100 yards to a whale. Where young are present, the approach is limited to 300 yards.

All of these laws limit our ability to get close to a whale. However, if the whale decides to do some human watching, you cannot be held in violation. Many of the pictures of divers with whales are cases where the diver was approached by the whale.

In the other situations where divers

entered the water to dive with the whales, they could be breaking the law unless they have special permission from the government. You cannot tell by a picture whether or not a diver was violating these laws, however in most such cases it is a probably a matter of being at the right place at the right time.

Q: I am an instructor, and conduct most of my personal diving along the New England coast. Over the years, I have seen a number of divers settle to the bottom and stir up clouds of silt. When I mention this behavior to them after the dive, most think it doesn't matter because they are on a mud bottom and not over a tropical coral reef. It is my belief that such behavior can cause damage to even seemingly lifeless areas of the sea bed. Your opinions please?

A: Areas of the sea bottom that appear lifeless should be treated no differently than the most pristine of coral reefs. Neutral buoyancy should be maintained at all times and touching should be kept to a minimum.

By stirring up the bottom as you describe, you lower the visibility in the water and can hurt or even kill animals around you. A multitude of animals feed on suspended particles (plankton) and an excess of inorganic material in the water can clog their gills.

When areas are dredged to clear a channel or to put in a tunnel, the waters must be monitored for the amount of suspended particles. If the level gets too high, the dredge must shut down temporarily. This saves bivalves such as clams, mussels, scallops and oysters, which are filter feeders, from breathing too much silt. Filter feeders are the most susceptible to silting. If they swallow too much silt, it clogs their gills and

THE MARINE MAMMAL
PROTECTION ACT OF 1972
PROTECTS ALL MARINE
MAMMALS FROM HARM
OR HARASSMENT.

Breathing here

is like breathing here with a TUSA regulator.



*The Imprex
TR400 and SS400
2nd Stage.*

Breathing becomes second nature when you're using our new lightweight, user-friendly, TUSA Imprex Regulator.

Which is why TUSA developed the Imprex with an adjustable primary second stage, a larger piston and hi-flow hose allowing a larger volume of air at any depth or tank pressure.

The adjustment knob offers smooth breathing rates while the deflector provides balanced, positive aspiration at any depth. The



*Deflector
Adjustment
Knob*

unique material in TUSA's regulator provides positive buoyancy that reduces jaw fatigue.

So if you've been looking for a dependable, high-performance regulator, you can breathe a little easier. The Imprex

Regulator from TUSA is here.

TUSA

The future of diving today.

Product Information 1

Tabata USA, Inc., 2380 Mira Mar Avenue, Long Beach, California 90815 U.S.A. (310) 498-3708; fax (310) 498-1390

can kill them.

A seemingly lifeless area could be teeming with life that you are not noticing. Clams may be buried in the mud only showing their siphons. Flounders and oyster toadfish are excellent at camouflaging themselves and may be right under you. Lobsters usually hide in crevices during the day and come out to feed at night.

Many other nocturnal animals hide during the day. This is why night dives are so fascinating; an entirely different group of animals come out at night and

can change what was considered lifeless during the day into an undersea odyssey packed with life!

Q: We were on a live-aboard in the Bahamas last year and after some dives I'd get itchy. I thought it might just be the salt from the water but my buddy said it was sea lice. Is there really such a thing?

A: Many small insect-like sea animals are referred to as sea lice by fishermen and divers alike. However, there is no specific animal by this name. What you experienced was probably an attack

by hundreds of larval crabs.

Once on you, they irritated your skin and may have even pinched you a little bit. When crabs are born they go through several larval stages before they grow into the critters we are all familiar with.

Most of these larva look like hairy mosquitoes and they all love to attach themselves to passing things. Diveskins act as a great attachment sight for these larva. Once on board, they can irritate your skin and cause you to itch.

To avoid this unpleasant experience, you might try washing yourself off with fresh water after the dive. The microscopic invertebrates that climbed aboard during your dive will quickly let go in an attempt to get back into their normally salty water.

Q: I've made several trips to the Florida Keys and I've heard many of the reefs called "spur and groove." What causes them to be formed that way?

A: Spur and groove, also called buttress and channel, refers to the arrangement of fingers of coral and valleys of coral sand that jut out from the Florida Keys. This type of coral reef is common around tropical islands that experience a lot of moderate to high seas. Such structures begin near the surface and usually end at a depth of eight to 10 meters.

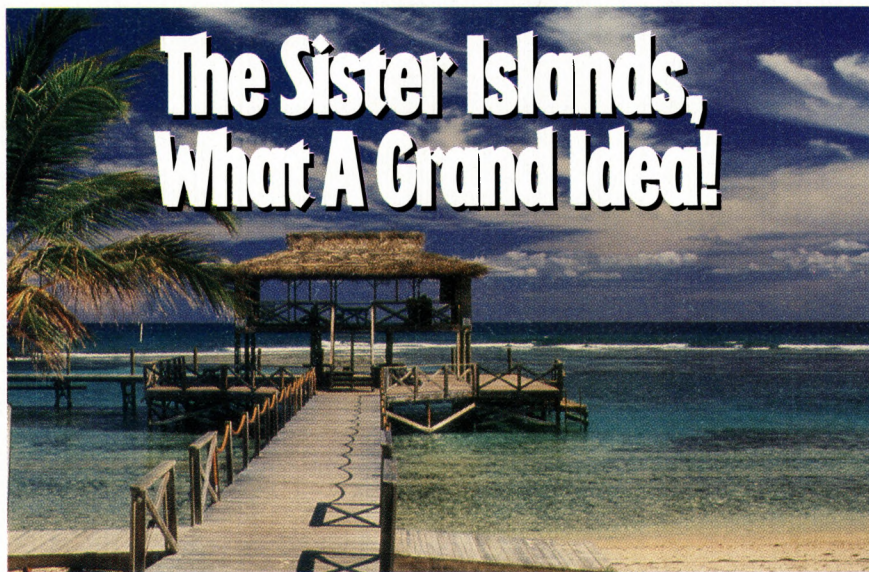
In the shallow waters of the spur and grooves, surge can be dangerously strong. As you go deeper, these effects are lessened. The spurs may be 30 meters long and up to 10 meters high. The grooves are usually one or two meters wide.

On occasion, coral actually grows over to the next spur forming a tunnel or cave. Because of the various depths and numerous hiding places formed by spur and groove reefs, they offer the opportunity to see a wide variety of sea life.

The exact fashion in which these spurs and grooves are formed is still not understood. It is thought that as coral heads form on the bottom, wave action prevents further coral formation right next to the head, but a few feet away where currents are not affected by the coral head, more coral can form.

As these islands of coral grow, wave action and currents move the sand next to the heads, preventing any further coral growth outward but not severely limiting its upward growth.

Not all reefs are in the spur and groove arrangement. The size and amount of wave action appears to be the determining factor.



And The Only Grand Places You'll Want To Stay, Little Cayman Beach Resort Or Brac Reef Beach Resort.

Almost anyone who dives knows about the Caymans. But the Cayman Islands are so much more than just Grand Cayman. The sister islands of Cayman Brac and Little Cayman are what Grand Cayman was like 25 years ago. Pristine beaches, clear blue waters, teeming with more fish than you've ever seen and we're closest to one of the most famous and spectacular dive spots in the world, Bloody Bay Wall.

And while you're at the sister islands enjoy a resort life-style at one of our expertly staffed, fully equipped, and intimate resorts.

So don't go all the way to Grand Cayman and not see what the Cayman Islands are truly famous for. The Sister Islands. We're what's Grand about the Caymans!

**BRAC REEF
BEACH RESORT**
CAYMAN BRAC, B.W. I.

**Little Cayman
BEACH RESORT**
A DIVE & FISHING RESORT
Cayman Islands B.W.I.

Exceptional Value
Packages From
\$303

Spectacular Diving, Grand Views, Oh...And Lotsa Fish!
Sales/Reservations 1-800-327-3835 - Ask About Our *ALL* Inclusive Packages!

Free information circle 63 on reader service card

Prescription Dive Lenses

... In your mask or ours, without bonding.

Experience the Difference:

- **Exact Prescription**

SeaVision® custom grinds both PLUS and MINUS prescriptions as well as correction for ASTIGMATISM.

- **Color Correction Filter**

Beat the blues and restore the colors lost at depth. SeaVision® patented filter restores colors like reds and yellows.

- **Contrast-Enhancing Lenses**

Optical filtering increases contrast and depth perception, adding more dimension to the underwater world.

- **Gauge Readers**

Read your gauges once again with our Bifocal Gauge Reader. Available with or without your distance prescription.

- **Fast Delivery**

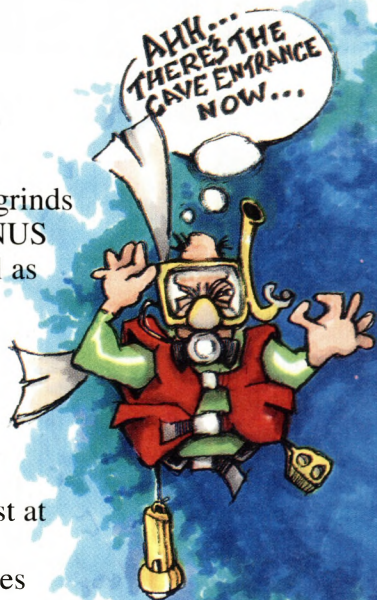
Custom SeaVision® lenses are usually shipped in about one week from the order date.

- **Light Weight**

SeaVision® is thinner and lighter because of our one-piece design. Without gluing or bonding, there is no delaminating or unsightly lenses to diminish your diving experience.

- **Custom Fitted**

Color Correcting prescription lenses are available in your mask or the SeaVision® mask.



DUFFY'S GOT A PROBLEM WITH "BAD VIS"...
EVEN WHEN THE WATER'S CRYSTAL CLEAR



SeaVision® lenses are made in the U.S.A.

Product Information 3

For more information or for a dealer near you, contact:
SeaVision® USA • 4399 35th Street North • St. Petersburg, FL 33714

Toll-Free 1-800-732-6275

Photo Op.

*Housed and submersible cameras
have different benefits*

CHOOSING CAMERAS

BY BRET GILLIAM



ANNE SOPHIE POZZOLI

Housings such as this Ikelite allow land-based cameras to be used underwater.

What's the best system for underwater photography? You may as well ask for an opinion on the most beautiful woman or the world's greatest religion. No answer will satisfy everyone.

No matter if Cindy Crawford or Christie Brinkley melts your butter, you'll still get an argument from the Lauren Hutton fans. Likewise with underwater photo buffs.

In this article, we're going to limit our discussion to comparisons between "housed" camera systems and true submersible cameras such as the Nikonos

and Sea & Sea models. Almost every diver has had a chance to be exposed to the Nikonos system either by seeing it in use on a dive boat or through the copious information available in diving magazines and underwater photo support books.

Submersible Cameras—There is good reason for the popularity of the Nikonos and its distant cousin, the "yellow submarine" Sea & Sea. In a nutshell,

they're compact, affordable and produce good results for divers of nearly all ability levels. Both systems have a modest selection of lenses for underwater use that range from satisfactory to excellent. As a starter point, let's take a look at what the submersible camera systems do well.

If you're a weekend hacker who likes to bring home a few snapshot style photos and likes the option of using a camera both on land and underwater, the "starter kit" versions of Nikon's Nikonos V with a 35mm lens or the Sea & Sea will fit your needs quite nicely.

They can be used equally well underwater or in less hospitable topside situations like white water rafting, kayaking, skiing or use around boats where the threat of sea spray or dunking arise. Or, they can simply be the best choice if you have to shoot outside in the rain.

Underwater, the 35mm lens is roughly equivalent to a standard 50mm lens on a land camera and presents specific limitations when submerged. Foremost among the drawbacks is that it's angle of coverage is fairly small, approximately 46 degrees. This will mean that the underwater photographer must back off to a distance of about six feet or more in order to full-frame a diver or other large marine critter.

Since light output from a strobe and the nuisances of suspended particles in water all become more difficult to control

as you move away from the subject, most photographers will want to reduce the distance between camera lens and subject as much as possible.

Use of strobes and artificial light sources is a whole different subject,

but suffice it to say that light is best managed within a relatively short radius, usu-

**BE SURE TO RENT BEFORE
PURCHASING IN ORDER TO
MAKE YOUR OWN
OBJECTIVE
DETERMINATION OF
QUALITY VERSUS COST.**

ally five feet or less. So in the quest of getting closer to the subject, other submersible lenses have been developed.

With the Nikonos system, the next choice would be a 28mm lens. This affords an improved 59 degree coverage underwater but cannot be used above water and will only stop down to f3.5, making it a bit limited in some low-light conditions. It's some improvement on the 35mm, but for photos of divers we're still talking about backing off a good way.

I use this lens almost exclusively when shooting skittish large marine life like schools of hammerhead sharks or wild dolphins. Since all conventional submersible cameras are range finder design as opposed to single lens reflex (SLR), you'll have to either jam your mask up to the little viewing eyepiece or spring for a separate viewfinder.

My luck with viewfinders for lenses in this focal range has been pretty grim. If you're close to the subject, you'll have to correct for parallax distortions which makes it difficult to frame fish or coral properly.

But if your budget allows some additional outlay, you're going to want to fleet up to a 20mm lens (78 degree coverage, f2.8) or the acknowledged "Mercedes" of underwater lenses — the wide angle 15mm. This provides a 94 degree coverage coupled with superlative optics. A multi-element optical viewfinder is available; don't even think about not purchasing it. Now you've got a system that is still the overwhelming choice of pros worldwide.

The 15mm lens allows you to full-frame a diver from only a three foot distance. This will radically improve your photos by reducing the light path necessary for the strobe to illuminate your subject and also will magically improve the apparent visibility by reducing the myriad variations of suspended particles in turbid water.

Sea & Sea offers a competitive 17mm lens that will mount to Nikonos bodies and has a wide angle lens that can actually be changed underwater on their own cameras as it locks on to the face of the standard lens.

There's a wide price difference between lenses in this range, so your pocketbook may dictate your investment. Be sure to rent before purchasing in order to make your own objective determination of quality versus cost.

Now some subjective opinion. Nikonos-style systems are best suited to

RED SAIL SPORTS
PRESENTS

Adventures With "Red"



"RED" DISCOVERS A SUNKEN TREASURE

"Red" found more than friendly fish on a recent trip to Aruba and Grand Cayman. Everyone's favorite dive buddy discovered a Caribbean gem: Red Sail Sports.

Come share with "Red" the wealth that is no secret to experienced divers—the service of Red Sail Sports. Enjoy pampered diving with the professionals as they guide you to the Caribbean's best underwater treasures with state-of-the-art dive boats and equipment.

Red Sail Sports rates are a steal for vacation pirates. Hyatt's "Dive Into It" packages feature luxurious accommodations starting at \$565 for a three night stay including daily boat dives. Plus, take up to \$100 off your dive package with the Reef Lover's Rebate.

Discover for yourself the Caribbean's greatest dive treasure.

Call today!

800-255-6425

Rate example is for the Hyatt Regency Grand Cayman, per person, based on double occupancy, 4/21-5/31 and 10/2-12/19/94. Certain restrictions apply to discount.

American Airlines

red sail sports

ARUBA

THE BAHAMAS

GRAND CAYMAN

HAWAII

Free information circle 11 on reader service card



LOUISA PRESTON

Submersible camera systems are generally less bulky than their housed counterparts.

wide angle (15mm) uses. In this application, they provide superior sharpness, clarity and more-than-adequate angles of coverage for almost any situation. They are perfect for working with models around reef formations, shooting large marine life such as whales or large sharks, and for capturing the panoramic beauty of the reef with incredible depth of field.

Additionally, this type of system is easily adapted to a variety of strobes and mounting arms. Fully assembled, the package remains relatively lightweight and easily swimmable. I make a good portion of my income as a professional underwater photographer and about 90 percent of my images are made with the Nikonos 15mm lens.

I've got five of these lenses in my arsenal. Two are the older version with a shortened length and these are incompatible with automatic "through the lens" (TTL) light metering. Although TTL is popular with many photographers, most pros shoot in manual functions with the Nikonos to expressly control the light and f-stop balance. So my older 15mm lenses are actually my favorites since

they are more compact and I like the larger format old-style viewfinders.

You can fit the 35mm and 28mm lenses with a variety of extension tubes



BRET GILLMAN

Housed cameras are better for fish portraits and close-up work. This photo was shot from 18 inches away.

or close-up kits that will allow them to be used in macro capabilities. This will allow you to produce extremely tight photos of critters, coral polyps or whatever but the framers that are necessary to show the photographer his focal area can be a problem. Some fish simply will not put up with the threat of a wire frame surrounding them no matter how practiced your bedside manner. And since the depth of field for focus is so limited, it's practically impossible to use extension tubes without the framers.

So what is the serious fish-portrait photographer to do? He's going to have to give some serious thought to a camera in a housing.

Housed Systems—This can be a big step up the investment ladder but an obligatory one if you're committed to working effectively with subjects that require some "space" in order to pose.

In essence, a housing lets you put an SLR camera inside a waterproof "box" while retaining virtually all the functional control of the camera's systems just as if you were on land.

Chet Tussey, of Tussey Underwater Systems, makes a few points, "The Nikonos is a viewfinder camera which means you do not see what the camera will take a picture of. The photographer points and shoots in a general fashion. With a single lens reflex camera, the photographer can see exactly what will appear on the film. This allows precise subject framing."

Tussey makes one of the best underwater housings currently available and knows from whence he speaks. Other advantages of a camera in a housing is that it can be used above water as well and there are virtually no limitations to lens selection. This provides the portrait photographer a proverbial "quiver" of weapons with which to stalk his wary quarry.

Now the photographer can maintain a comfortable distance from a tiny tropical fish with no threatening wands, framers or appendages to frighten it. It also allows him to shoot an elusive subject in a deep crevice or tiny hole since he is capable of zooming in with a plethora of macro lenses.

There are some tradeoffs, of course. A housing is heavier, bulkier in size, and more expensive. Let's make a few comparisons:

Cost Comparisons—Exclusive of strobe, a fully set up Nikonos system including a camera body, 35mm lens,

15mm lens with viewfinder and extension tubes will run in the range of \$2,600. A similar system from Sea & Sea will run several hundred less.

With a housed system, you have to make an initial investment in an SLR camera with some lenses before you can do anything. So let's assume you go with the popular and versatile Nikon 8008 body, a 105mm AF Micro lens, and a 20mm AF lens. This is a fully auto focus, TTL metered system with top of the line optics. It's going to set you back about \$1,500 depending on how aggressively

you shop. So that's the basic ante to sit down and play photo poker at this level. Now let's put it all in a housing.

We'll look at four options among the major players. First of all, the Ikelite lexan housings represent the softest touch to your wallet. For about \$700 you can get into an SLR housing with a macro port and a dome port for wider angle lenses. This will have recommended depth limit of 150 feet, close to Nikonos' recommendation of 160 feet.

The thermoplastic compact Stromm housing with macro and dome ports will

come in around \$1,150 and still keep you at 150 feet.

The cast aluminum housings with both ports offered by Tussey and Aquatica both tip the scales at around \$2,350, but offer construction that is arguably bulletproof and allows working depths to 350 feet.

As you see, it will cost up to 50 percent more to get into a housed system, but the benefits may be worth it to you. In addition to the aforementioned ability to precisely frame and focus with sometimes spooky subjects, you also can take advantage of greater lens selection, a much wider selection of strobe to camera sync shutter speeds, motor drives and more than twice the depth capability in the case of the cast housings.

Tussey continues, "With a Nikon 8008 in one of our housings using auto focus, fish pictures of all sizes are easy. Focus is incredibly sharp and the TTL lighting is superior to that of a Nikonos V. The choice of lenses in a Tussey housing is unlimited from extreme macro to ultra wide angle. Consider the auto focus Nikon 14mm lens. This has over 20 degrees more angle of coverage than the Nikonos 15mm. We even provide a leak detector, both audio and visual, to warn you before damage can occur."

RS-Hybrid—Still another choice available to well-heeled photographers is the new Nikon RS system introduced at the 1993 DEMA show. This is something of a hybrid between their venerable Nikonos series and housings. It's not a lot smaller than some of the housed systems, but is completely submersible with a modest selection of interchangeable lenses including a 55 mm macro and a 20-35mm zoom lens.

It features auto wind, auto focus and a sophisticated TTL metering function along with through-the-lens viewing (a first for a genuine submersible camera). A new series 104 wide angle strobe rounds out the package. In its current configuration, it seems best suited to fish-portrait style shooting, although the zoom lens has some intriguing composition scenarios at mid range in clear waters.

Nikon intends to introduce a wide angle lens in early 1994 that will work on the RS and actually exceed the coverage of the conventional Nikonos 15 mm lens (the mounts are not compatible so use of your regular Nikonos lenses cannot be accommodated.)

The down-side hits you right in the wallet: You'll be looking at around

Polarized Perfection.



- 99.9% Polarization
- 100% UV Protection
- Glass lenses: mirrored or non-mirrored
- Prescription lenses available

Ocean Waves Sunglasses Are the Best in the World!
Try on a pair and see for yourself.



Atlantic:
Backwater Green Lenses

Ocean Waves

Call for a catalog & your nearest dealer

1 (800) 749-9920
Atlantic Beach, Florida



This banded male seahorse was photographed with a Nikonos 35mm lens and 2:1 extension tube at a distance of 6 inches.

\$8,000-\$10,000 to get fully into the system depending on where you shop.

Many pros have found the system too pricey for its limitations and bulky size. Unless you have hands like Michael Jordan, you'll probably find it difficult to hold one-handed. While some divers have embraced the product, others opine that for this kind of money, you're better off in a full-blown housed system

leaving you with every opportunity for full lens selection, more versatility and the option of topside use.

Summary—As an overview, this information can give you a lot to mull over. After working with just about every system that's come along since the late 1950s, one thing is for sure: Today's underwater photographer has more choices and vastly superior

equipment from which to make that selection today than even five years ago.

The bottom line for me is convenience and the ability to get the job done. I'm completely satisfied with the Nikonos system and a stable of 15mm lenses to shoot my stock-in-trade images of working divers, models, big animals or wide-angle scenes. It's an easy system to carry underwater, in fact, I frequently carry three camera bodies on a single dive by using chest-mounted clips. In spite of what the manual says, the Nikonos will work to depths approaching 240 feet.

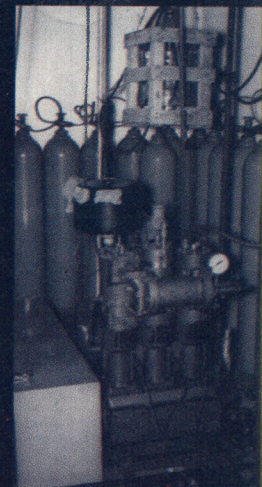
But for fish work and close up material, a housed system simply cannot be equaled by anything else. Period. And I've taken Aquatica and Tussey housings below 400 feet without a whimper for technical diving projects where the Nikonos could never venture.

Your personal bottom line has to be the consideration of cost versus benefit. Start with a submersible camera system with a decent wide angle lens. As your interest and proficiency grows, you may find that working within that type of system will still allow you the satisfaction of photos that meet your personal needs. But the superior advantages of a professional quality housed system are undeniable if your shot list calls for portrait-style inventories, increased flexibility of lens selection or deeper work. I use both systems for specific applications.

Stop by your local dive store or photo specialty retailer and actually get your hands on this stuff. Make sure that you seek out a store that can let you talk with a real photo pro, not just a salesperson who got some merit badge for underwater photography along with his "60-day-wonder" dive instructor certification. You're going to have questions, and a good pro will help ask you some that you haven't even thought of yet.

Underwater photography is a special joy that will enhance your overall enjoyment of diving in ways you never imagined. With a camera in your hand, every dive is an adventure with the potential for that once-in-a-lifetime shot. ■

Bret Gilliam is President of Ocean Tech and a member of the Board of Directors of NAUI and IANTD. His underwater photography has been published worldwide and he is a contributing writer and photographer to seven diving magazines. He took his first underwater photo with a rangefinder Mako camera in 1959.



Bob and Bill Meistrell

Members, Diving Hall of Fame
Members, Pioneers Hall of Fame
Founders, Body Glove Wetsuits

THE 6.5mm NO-ZIP DIVESUIT (#1320)

All Nylon-2 material with an attached hood; a Patented sash design; glued and blindstitched seams; kneepads; face seal; Velcro® shoulder lock; lycra edge taping; keypocket; screened graphics.

No-Zip sash design Patent No. 4809364



Product Information 34

THE MEISTRELL SIGNATURE SERIES (#1312)

All 6.5mm Nylon-2 and Lycra/Nylon; glued and blindstitched seams; patented slanted zipper design; pre-bent knees and elbows; kneepads, Lycra edge taping; keypocket; screened graphics.

Also available in two-piece combination (#1313).



CUSTOM DIVE BOATS
by

Rob Shirley

Taking A Dive Vacation?



The *Pro 42* The Custom Dive Boat is a solid fiberglass boat. No balsa core or glass-covered wood floors & stringers. It's state-of-the-art. Designed by Rob Shirley, founder of the world famous Mastercraft Ski Boats—known for their construction methods, advanced technology & innovative ideas. Rob has earned his expertise & knowledge from the water ski world to the diving world.

You put a lot of trust in your dive operator. If he has a *Pro 42*, rest easy. It's the safest boat around. A solid fiberglass construction—no wood stringers or floors—a dependable diesel engine & maybe best of all, a jet drive system—no propeller to fear. Many injuries occur each year due to propellers. He'll save money, too, from propeller & component damage. Let's hope he has one—if not, tell him to get one. You'll be happy, and he will too.

For more info—

call, write or fax Custom Dive Boats
PO Box 30365 SMB Grand Cayman, BWI 809-949-3959
Fax 809-949-1277 or contact the sales office:
6700 S. Fla. Ave., Lakeland, FL 33813
813-644-4131 Fax 813-648-4931

Rob Shirley

COMMENTS

I just returned from a great dive trip. We were in Cozumel & the people we were diving with just happened to be trying out a new boat and we were lucky enough to be on it – no propeller, what a great idea – we only did one dive but I can tell you – I was impressed, what a great dive boat. When I received my PADI Undersea Journal, I noticed your ad in it. I recognized that this was the boat we were on in Cozumel. I just wanted to send you a compliment. If I owned a dive operation, I'd have one.

Ed Peters
San Francisco, CA

On a recent trip to Little Cayman, I had the opportunity to go out on one of your Pro 42 Dive Boats based at Little Cayman Beach Resort. You must have put a lot of research into building that boat – I've been diving 25 years & I've never been on such a pleasurable dive boat. Everything is so well thought out. Lots of room; great seating & easy tank racks; the very best ladder I've ever used; and the safety factor of no propeller – wow – why doesn't every dive operator have one? And by the way, that Little Cayman Beach Resort provided me with the best dive vacation I've ever been on, & your boats are great.

Gene Smalley
Grand Rapids, MI

Dear Rob,

Just a note of appreciation. Thanks a million for providing our operation with 2 Pro 42 Dive Boats. We've got 400 hours on one and 600 hours on another and we've had nothing but pleasure from them. We constantly get compliments from customers and they are so easy to maintain. Our fuel consumption is averaging about 7 1/2 gph...unbelievable. You obviously knew what you were doing when you went with the jet drive – it's great. It will go in places we can't get to even with our dinghy.

I would like to point out that the most obvious advantage is the safety factor. This boat is built like a rock. As our operation grows, we'll buy another one.

Ed Morris
Little Cayman Beach Resort

To the Pro 42 guys,

Recently we had a group of divers that were diving with another dive operator here in Key West. They came in our shop and requested to charter with us only if they could get the new Pro 42 Dive Boat. They saw it out on the dive site the day before and got our name. This has to be the best testimonial. We got business from our competition, just because we have a Pro 42.

Thanks,

Ed Rusic
South Point Divers
Key West, FL

P.S. Also thanks for using our boat in your ad.

For more information,
call, write or fax.

Custom Dive Boats
PO Box 30365 SMB
Grand Cayman, BWI
809-949-3959
Fax 809-949-1277 or
contact the sales office:
6700 S. Fla. Ave.
Lakeland, FL 33813
813-644-4131
Fax 813-648-4931

Skills Review

*Night diving is a natural extension
of your diving activities*

NIGHT DIVING

BY GARY CLARK

After you've been diving for a while, you may feel the need for something more adventurous, more daring than sightseeing around the reef. You've probably gained experience and confidence and want to stretch yourself a bit. I suggest night diving.

Night diving is a natural extension of your diving activities. The contrast of dark water and creatures glowing in the beam of your dive light creates a spectacular, surreal combination that is one of the most spellbinding encounters you will ever experience.

Best of all, safe night diving only requires a few pieces of special equipment and a few special techniques

know what they can see at night. The answer is: anything there is to see during the day, plus a whole lot more. Coral polyps, the creatures that live within the coral, come out at night to feed. Parrotfish can be observed sleeping. An entertaining sight is bioluminescence, which is emitted by tiny organisms that glow when a light source is removed from them.

As you might imagine, capturing night life on film and video is a major activity. In fact, the absence of filtered

Underwater Lights—Underwater lights are obviously important because you cannot see without one. For safety reasons, you should carry three lights. The main light is called the primary, because it is usually the largest, brightest light. In addition, you should have a secondary light in case either your or your buddy's primary

goes out. Secondary lights are usually smaller lights, and should be easily accessible in the dark. Chemical lights, or "glow sticks," are also valuable. Chemical lights, which glow rather than shine light, are commonly attached to a diver's tank valve and allow buddy teams to keep track of each other easily in the darkness.

Underwater lights have a variety of variable features such as the brightness and width of the beam, the type of grip used (pistol or handle), and the type of battery used (rechargeable or non-rechargeable). Regardless of what features you prefer, your light should be reliable and designed for use underwater and under pressure. Lights that are labeled merely as water resistant will leak and implode under pressure — a very unsafe situation. In addition, your light should have a lanyard, which is a strap or rope connected to the light that also secures around your wrist. A lanyard allows you to let go of the light without losing it.

Surface Lights—In addition to underwater lights, you will need a surface light. The main purpose of a surface light is to mark the entry/exit point so you can locate it easily upon surfacing. Another reason to have a surface light is to provide illumination while gearing up and down, and for entries and exits.

**SAFE NIGHT DIVING
REQUIRES ONLY A FEW
PIECES OF SPECIAL
EQUIPMENT AND
TECHNIQUES BEYOND THE
OPEN WATER LEVEL.**



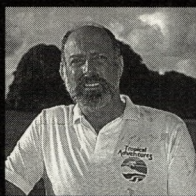
JOSEPH OLIVER

Start night dives before it gets too dark so you can evaluate water conditions.

beyond the Open Water Diver level. This article will outline the most important aspects, but it does not cover everything. Before checking out the fabulous night life of the underwater world, you should seek specialty training from a professional dive store.

Activities—Many divers want to

sunlight means photographers can take purer photos with their flashes. Underwater hunters also have a better chance of finding lobsters in the dark because they come out of their hiding places and roam the ocean floor. These are just a few of the many activities you can enjoy at night.



Bob Goddess'

WORLD OF DIVE TRAVEL

CELEBRATING
OUR 20th YEAR

COZUMEL



Plaza Las Glorias

- A superb 5-star resort
- All oceanfront & jr. suites
- Walking distance to town
- 3-tank boat diving

Exclusively with...



PLAZA LAS GLORIAS
*Experience Cozumel
at its very best!*

LITTLE CAYMAN

Now! Fly **DIRECT** on our own private charter.

**BLOODY BAY WALL
BLOODY GOOD DIVING!**



A
First Class
World Class
Resort
Operation

FIJI ISLANDS

**AN UNBEATABLE
COMBINATION**

Combine beautiful
Matagi Island Resort
with a marvelous 4-6 night
live-aboard experience
aboard the fabulous new



MATAGI PRINCESS II
The Idyllic South Pacific!

AUSTRALIA



PACIFIC STAR

- Spacious catamaran.
- **Personalized service.**
- Six private cabins.
- Ensuite bathrooms.
- Great Barrier Reef.
- Coral Sea.



CAYMAN BRAC

What
GRAND CAYMAN
was like 25 years ago



CAYMAN BRAC, B.W.I.

"THE GREAT ESCAPE"

STUPENDOUS DIVING

Now! Fly **DIRECT** on our own private charter.

INDONESIA

**AN ADVENTURE IN
LUXURY**



CEHILI

- A spacious 140 feet.
- 10 private cabins with bathrooms.
- 1 & 2 week cruises.

**SPECIAL
PAY 3=1 FREE!**

East Africa • Red Sea • Seychelles • Indonesia
Borneo • Australia • Micronesia • Cayman • Belize
Cozumel • Turks & Caicos • Fiji Islands • Solomons
Papua New Guinea • Thailand • Sea of Cortez • Saba
Galapagos • Cocos Island • Roatan • Guanaja • Bonaire



**TROPICAL
ADVENTURES**
TRAVEL

800-247-3483

WA(206)441-3483 • FAX(206)441-5431 • 111 Second North • Seattle WA 98109



DOUG PERRINE

Some animals like this toadfish on La Ceiba Reef in Cozumel only come out at night.

For shore dives, the most effective surface lights are gas lanterns, flashing lights and street lights. Gas lanterns are very bright, quite reliable and provide sufficient light for equipment assembly.

Flashing lights make entry/exit points easy to see, but many do not provide adequate light for dressing. Street lights are excellent surface lights, but they are not available at every dive site.

When setting up surface lights, it is best to have two lights, one positioned higher than the other. When seen at a distance, lights in this position can be lined up as a directional guide. When

Quicksilver Inflatables Get You There

Great dives begin with Quicksilver Inflatables. Fast, maneuverable and stable for the trip out. A rock-solid platform with a wide beam and low center of gravity when you get there. The low freeboard and soft tubes make it easy to get in and out of, too.

No trailers to hassle with. No launching ramps, dock space, mooring fees or winter storage either. Easy to unpack, assemble, inflate and launch by yourself. And in just minutes. Choose from nine models, including Sport and new rigid-hull models, ranging from 7'6" to 12'6".

As a dedicated dive boat or a combination dive boat/water toy for the kids (or yourself), you can't beat Quicksilver Inflatables. They'll get you where you want to be.

See your local Mercury, Mariner, Force or MerCruiser dealer. Call toll-free 1-800-552-3882

for a Quicksilver Inflatables catalog and select from a Mercury, Mariner or Force Outboard catalog and get the new Dacor diving catalog—all free. Or write to Quicksilver Inflatables, P.O. Box 3900, Peoria, IL 61614.

PORTABLE, AFFORDABLE FUN.SM

© Brunswick Corporation, 1994 Products of Mercury Marine. A **BRUNSWICK MARINE** COMPANY.

Free information circle 73 on reader service card

using flashing lights, be aware that in most navigable waters a flashing light is a sign of distress. Check with your local dive store before using this type of light.

If you are diving from a boat, there should be both sufficient above-water lighting to facilitate gearing-up, and an underwater beacon attached to the dive ladder to mark the boat's location and exit point.

Preparing to Dive—The first step in preparing for a night dive is to make a solid dive plan with your buddy. One of the key considerations is dive site selection. It should be suited to your experience levels in all ways, be compatible with your dive objective and have easy entry and exit points. Preferably, the site should be one you both have dived during the day. Having a facility to change into and out of your exposure suit is also nice.

You should arrive at the dive site well before dark to evaluate the conditions. This is also the best time to transport equipment and set up surface lights. It's also easier to perform a thorough equipment check while there's still daylight.

Whenever possible, you should find someone to wait on the surface

while you dive. This person can watch the surface light, your equipment and the weather. If you are diving from a boat, the person should know how to operate the boat, the anchor system and the radio. If you can't find someone to go with you, at least tell a friend where you are diving and when to expect you back.

If the night dive is your first, air consumption may also become an issue. Most first-time night divers are so amazed, they breathe air at an accelerated rate. To help extend bottom time, I suggest you review "Making It Last" in the preview issue of *Sport Diver*. To avoid an out of air situation, check your submersible pressure gauge frequently.

Entering and Descending—The best time to enter the water is dusk, just before dark. Be cautious when entering from beaches or rocky shores, as it is easier to slip and fall at night. After entering the water and prior to descending, check your primary and secondary lights to make sure they work properly.

The safest way to descend at night is by using a line, although one may not always be available.

A line allows better control and helps prevent a condition called vertigo

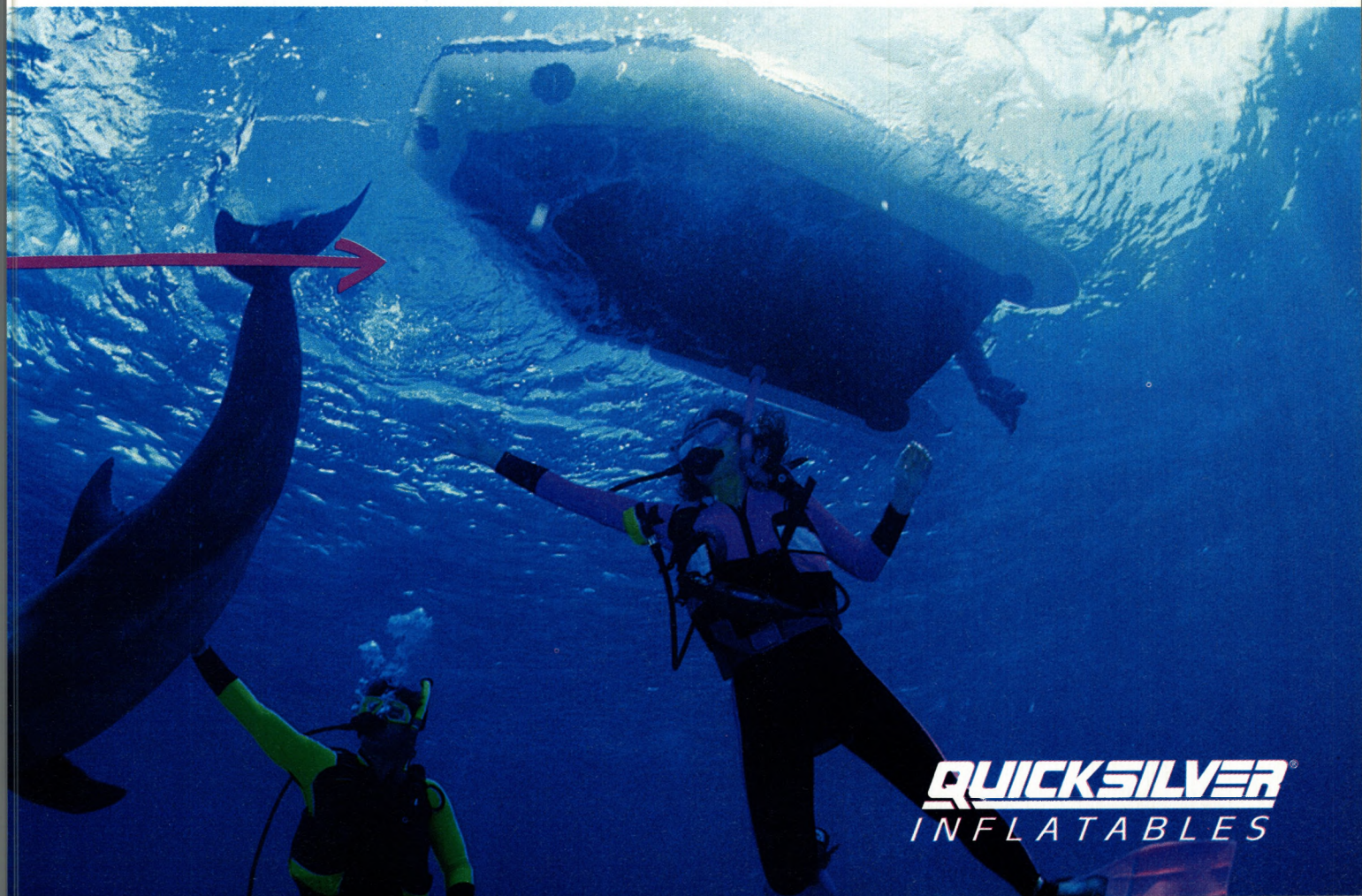
(see sidebar). Another safe way to descend is to follow the bottom contour. When descending, shine your light downward so you can avoid "crash landing" onto the bottom.

What To Do During The Dive—Look under ledges for sleeping fish and along the bottom for moving creatures. Also notice the colors. Many divers do not carry lights during daytime dives and don't realize how much color is lost as light is filtered by the surrounding water. A dive light restores these brilliant hues.

But colors aren't the only thing darkness affects. Because the visibility is limited to the distance your light shines, you cannot rely heavily on natural navigation.

Using a compass is a valuable night diving skill. Limited visibility also means you need to stay close to your buddy. Remember that should you lose your buddy, he or she may be more difficult to relocate at night.

What To Do If You Lose Your Buddy—The best procedure is a series of logical, predictable actions, each done for a reasonable period of time. This approach maximizes your chances of finding your buddy, without wasting time and energy. The procedure should be



QUICKSILVER
INFLATABLES

WHAT IS VERTIGO?

It is important for night divers to understand how vertigo is caused and avoided, because the night diving environment is particularly conducive to it. Vertigo is an unnerving phenomenon of feeling movement, but not being able to gauge mentally the speed or direction of the movement. It can occur on descent, during the dive or on ascent.

Many divers experiencing vertigo report dizziness, an unpleasant "whirling" sensation, feeling lightheaded and even a nauseating motion sickness. It can cause divers to descend when they thought they were ascending, and to descend and ascend too fast. It is also an unwanted source of stress.

To understand vertigo, you must know a little about your ears. The ear is divided into three basic parts: the outer ear, the middle ear and the inner ear. The inner ear has a balance mechanism that controls orientation and movement. Sensations from the inner ear are sent to the brain, which interprets them and orders the appropriate body movement to maintain balance while walking or running, for instance.

As a diver, it is important to realize that your sensory processing system is

oriented to land, not water. In the weightless underwater environment, it is not uncommon for divers to become disoriented.

During a night dive, a number of situations can cause vertigo. Descending too quickly in dark water can induce vertigo because your senses have difficulty discerning the speed without references. Descending head-first puts the inner ear at an angle which tends to produce vertigo.

Another common cause is a pressure difference in the left and right middle ears. On descent, this occurs from inadequate equalization. On ascent, it happens because the air escaping from the Eustachian tubes is unequal or inadequate, which is also called a "reverse block." Cold water entering your outer ear can cause disorientation until it is warmed. If your hood does not allow proper water flow, water may enter the left and right ears in unequal amounts which can lead to vertigo.

To avoid vertigo, descend feet first using a line, watch your depth gauge and stay close to your buddy. If you experience vertigo, focus on a reference point, such as your buddy. If you have trouble on ascent, watch your bubbles; they always go towards the surface.

discussed by you and your buddy as part of the dive plan. A typical procedure is:

- When you realize your buddy is missing, swim up a few feet. Point your light tightly against your chest to hide the beam (do not turn it off!) and look briefly for the glow of your buddy's light.

- If you don't see him or her, hold your light straight out and make two 360 degree turns.

- If you have not located your buddy after 30 seconds, ascend normally to the surface.

- Wait one minute, looking for a light or bubbles you can follow back down.

- If you have not located your buddy, there may be trouble. Take appropriate emergency actions.

Using Underwater Lights—The most important rule when using lights is: never shine the light into your buddy's eyes. If you have ever had your picture taken and looked at the flash as it went off, you should understand this rule perfectly.

If you want to get your buddy's attention, the proper way is to shine the light either at his or her body or on the bottom in a quick back and forth or circular motion. To communicate, shine your light on your slate or your hands

The Diver And Computers Finally Come Together!

From



Today Divers from around the world require software that functions in a graphics mode environment. ScubaSoft has achieved this and much more.

ScubaSoft has been developed by Certified Divers coupled with feed back from an International User Base from over 11 different countries.

Whether you are an open water diver or instructor you will appreciate its flexibility and ease of use.

Our New Version 2.1 is truly the Diver's delight. From its multiple diver user feature to its instructors module ScubaSoft records, plans, profiles, logs and calculates right at your fingertips.

Since ScubaSoft 2.1 is a tool not a toy you might have wondered how you got along without it up until now.

ORDER TODAY OR CALL FOR MORE INFORMATION

2316 Delaware Avenue, Suite 297, Buffalo, New York, U.S.A. 14216 Telephone (905) 278-8895 Fax (905) 271-6065
92 Lakeshore Rd. E., Suite 208, Mississauga, Canada



HARDWARE REQUIREMENTS:

Minimum 560 RAM, EGA or VGA graphics card, DOS 3.3 or better, Ascii Text printer, Microsoft mouse or compatible.
IBM PC compatible.

to illuminate your message.

What To Do If Your Light Goes

Out—As well made as diving lights are, you should prepare for underwater light problems. To prevent problems, check the bulb, have fresh batteries and assemble the light properly.

Should your light fail, however, the easiest and safest procedure is to switch to your secondary light. If you don't have a secondary light, your options are to alert your buddy by banging on your tank or to surface if your buddy is not available. In this case, it is impractical to search for him or her in the dark. If you must surface without a light, remember, losing a light does not need to be an emergency if you maintain a clear head and stay in control. Make as normal ascent as possible and employ lost buddy procedures.

Handling the loss of a light and other problems are good reasons to stay close to your buddy, carry backup lights and receive proper training from a professional dive store.

Ascending and Exiting—The key consideration of a night diving ascent is the rate of ascent, which is why a line is so valuable. Without a line you must monitor your depth gauge or computer closely. Also, shine your light upwards so you don't bump into anything. To help read your gauge, shine your light on the gauge face just before ascending. This will activate its light-sensitive faceplate and cause it to glow. Remember that some computer readouts do not glow and shining your light directly on them will make it harder to read the information.

Before exiting, you must first locate the exit point. After surfacing, follow your shore lights, but evaluate the safety of long surface swims. Boat traffic is a potential hazard, so following a compass heading underwater may prove safer. When exiting, be extra cautious if you are tired to avoid falling.

Summary—If you think of diving as entering a different realm, then consider night diving as visiting a different planet. The best part is that it's relatively easy. All it takes is some additional training, a few pieces of additional equipment and the desire to discover the night life of the underwater world. 

Avid night diver Gary Clark is an instructor and director of member services for SSI.

Innovation

quality & style

that's surprisingly

affordable...

The Subaqua

Series from Bare.

A complete

neoprene

program for

sport

diving.

For more info:

Bare

Sportswear Corp.

P.O. Box

8110-577

Blaine, WA

98230, USA

Shown
2 mm FULLSUIT
Photo
JETT BRITNELL

DARE TO GO

BARE!

BARE

Free information circle 8 on reader service card

Boat Diver

Small-boat diving offers its own special challenges and benefits

SMALL BOATS

BY TOM TURNER

Small boat diving, especially drift diving, can be very rewarding. The freedom to dive where you want, when you want, and with some of your best buddies can be habit forming. If you have your own small boat or dive with someone who does, then you know about the rewards.

Many of the practices presented here are based on personal small boat diving experiences from dives done in the Southeastern U.S., both inland and offshore and are certainly open to modification based on your local and individual needs. Like many other endeavors involving Mother Nature, we can't control all the variables such as weather, seas or visibility. But we can offer some suggestions on how to make the rest of the trip go smoother.

Check your rig—Yes, check your rig. You've probably seen this suggestion in more than one dive manual, and it's certainly worth repeating here. Take 30 minutes the evening before your dive trip and give all your gear a good once over. If you haven't used your equipment in some time, be extra thorough — and start a day earlier, so you can get to a dive shop to replace last minute items.

But even if you have used your gear recently, say the weekend before, it's still important to hook up your regulator to a tank, breath off both second stages and check your power inflator. It never ceases to amaze me how a piece of gear that was "working fine" just last whenever now wants to freeflow, stick, not turn on or otherwise malfunction. This event is much easier to deal with on your living room floor than on the deck of a small rocking boat while your buddies are ready to get wet.

If you have a spare regulator set, it's well worth checking it out and packing it up as well. If your main regulator should go down, it's much easier to

swap out the whole set than to attempt an individual hose replacement at sea.

Now that you have all your gear together, gather your other essentials such as water, food, raingear and anything else the captain suggested. With this task behind you, you can sleep well knowing the most you'll have to think about in the early morning hours is getting yourself and your bags to the boat.

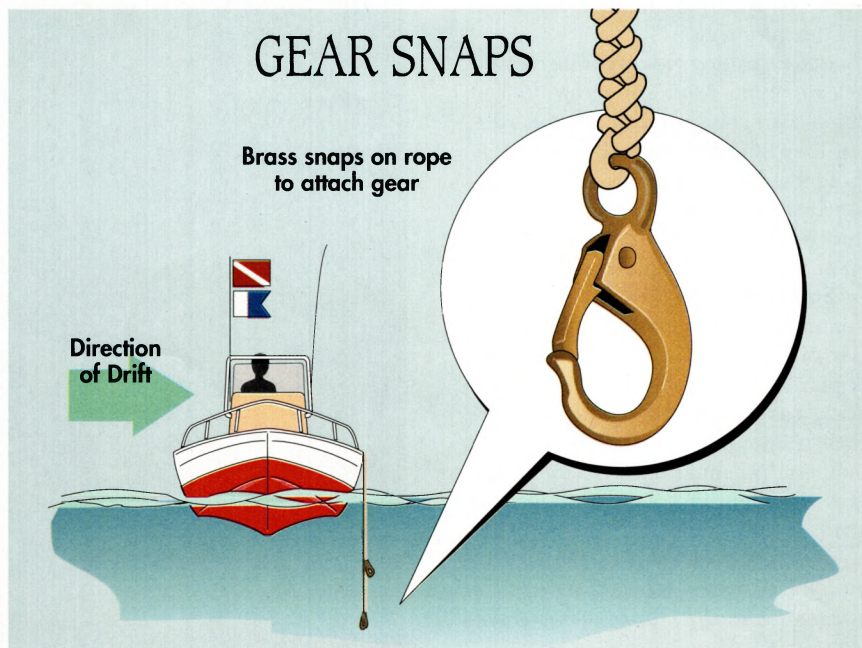
Onboard—Once onboard, think small. The importance of keeping your gear organized and contained in a dive bag, bucket, basket or assigned portion of deck is paramount. Just the minimum gear for four divers to conduct three "sightseeing" dives each can quickly expand and cover the entire deck of a small boat like a creature from a bad sci-fi movie. Now, to this minimum gear, add some still or

video cameras or perhaps some spear guns, catch bags, handheld lights or even a DPV or two and you can be tripping over some very expensive clutter.

Save time with teamwork. A common scenario for our group is to have two divers remain on the surface while two dive. This leaves one person to drive the boat and another to rig gear, swap out used tanks or make lunch. Where the extra person is most valuable though, is helping the dive team immediately before and after their dive.

The fewer people moving around the boat, the better. While the two "on deck" divers prepare to go overboard, the third person can assist by steadying tanks, checking valves to ensure they're fully open and then bringing over any additional gear they may need. This cater-

**SMALL BOAT DIVING
DOESN'T HAVE TO BE
DIFFICULT OR
DANGEROUS. IT SIMPLY
REQUIRES A GOOD
ATTITUDE.**



DAVID UNDERWOOD

ing, so to speak, has multiple benefits. First, we have only one unencumbered person moving about, lessening the chances of a half-kitted diver falling overboard or, depending on sea conditions, just falling down. Second, the divers are able to relax at their rigging stations using the extra time to review their dive plan and cross-check each other's gear, all the while not incurring additional thermal stress. Finally, the divers are more likely to enter the water with everything they need since they just have to ask for it instead of getting up themselves.

Overboard—Once the divers are in the water, cameras, spearguns or other additional gear can be passed to them, protecting the equipment and simplifying the entry. At this point our divers normally descend along a weighted jug line that marks the starting point of their dive. Topside, the extra person now records the time of day onto a waterproof slate near the helm. This "time stamp" allows for accurate dive logs, but more importantly helps to ensure correct surface intervals by backing up bottom timers and computers.

The divers now have the choice of carrying the marker line and float with them or leaving it as a reference point for the next set of divers. This decision is usually made before the dive and is based on sea conditions and proximity of other boats. For example, calm conditions with few or no neighbors would allow for the boat to simply follow the diver's bubbles, thus reducing the task load for those below.

It should be pointed out that when operating in this mode, the boat must fly all the required and appropriate flags indicating diver operations. Even then, it may become necessary to actively protect the divers from errant fishermen who sometimes feel compelled to race right up to these "fish below" flags and then fire down 12 ounce jigs in hopes of getting their rods "bowed up."

Active protection can run the gamut from simply positioning the boat between the divers and the fishing vessel while giving the other boat a friendly wave-off to more extreme measures like close passes with firm explanations of just how far to keep clear. Of course it is best to avoid these encounters if possible, but if you do have to make contact, keep the event friendly, brief and simple. Remember, your first responsibility is to stay on top of your divers and be ready to assist them should they sur-

face with any type of problem such as lobster too large to fit in their catch bag. Well, you get the idea.

Easy Does It—When divers surface after completing their safety stop, there is a need for special caution. First we have two divers in the water. They may be tired, excited or even injured and their reactions might not be the best. To this we add sea conditions that may have worsened since they went down and lastly, we add in the boat and it's underwater running gear. Our solution to this situation involves

three steps. They are: a slow and controlled upwind approach, use of a gear line and generous help from the extra hand on deck.

We prefer to approach the divers from the windward and usually almost abeam to the wind. This allows the boat driver to shut down the engine earlier and use the wind to bring the boat and divers together. With this plan, the boat also "makes lee" for the divers by blocking the wind and waves somewhat.

Once the motor is secure, we then deploy a gear line from a spring cleat on

WE'LL BLOW YOU AWAY!



Rated by experienced divers as the best liveaboards on Earth, the "Lammer Law" and the "Cuan Law" offer the incredible Galapagos and the scenic British Virgins. Our superb service, inspired meals and caring crew will spoil you until only our standards become acceptable.



1-800-648-3393

Product Information 15

TORTOLA, B.V.I.

US Address: Trimarine, Inc. • Box 4065 • St. Thomas, U.S.V.I. 00803 • Fax 809-494-5774

Photos: Jim Scheiner

the diver's side of the boat. A cleat located in the middle or last third of your hull is best because the hull is less affected by wave motion at this point.

The gear line itself is one of the simplest and most useful items we carry onboard. The line is a 12 foot length of 7/16" nylon dock line with a spliced loop at one end for attachment to a cleat and three short loops near the other end fitted with a large brass boat snaps.

Here's how it works. As soon as the divers are within reach, we take any loose gear they may be holding and set

it in the boat. Next, we clip one of the divers off to the gear line by attaching it to the lifting loop on top of the BC. We then take that diver's weight belt and place it in the boat. At this point, the clipped-off diver can ditch his BC and move toward the ladder.

While this procedure may sound a bit involved, it's really quite fast and easy in practice, and stems from several sound reasons. First, we know that immediately following a dive, blood gas tensions in the diver are elevated and that exertion at this point is a definite

predisposing factor to DCI. By removing the diver's tank and weight belt, we can make their climb onboard much easier.

Second, most small boat dive ladders seem to have been designed for an agile 80-pound, 12-year-old kid instead of your normal 150-plus pound diver

SMALL BOAT DRIFT DIVING SUGGESTIONS

1. Diver-down floats — Use bubble trails and float balls as needed to stay close to the dive team and be alert for unexpected ascents.

2. Familiarize the crew — Everyone on board should know how to operate the boat and VHF radio.

3. Carry appropriate safety gear — In addition to Coast Guard required items, this should include first aid and surface oxygen.

4. Track bottom times — Dive and surface intervals for all divers should be recorded at a central location.

5. Fly appropriate flags — Many operators use only the "diver down," but the Alpha is technically required, and it also helps you look more official.

6. Demand your space — Keep fisherman and other dive operators away from your divers. At the same time, practice common courtesy and sense. Don't start a drift dive just upcurrent of an anchored fishing fleet.

7. Organize and eliminate — Space is at a premium, so keep clutter and unnecessary gear to a minimum.

8. Respect the environment — Don't throw trash overboard, and be careful when anchoring.

9. Limit exertion — Encourage divers to rest after dives and allow for a reasonable interval before making hard runs in rough seas soon.

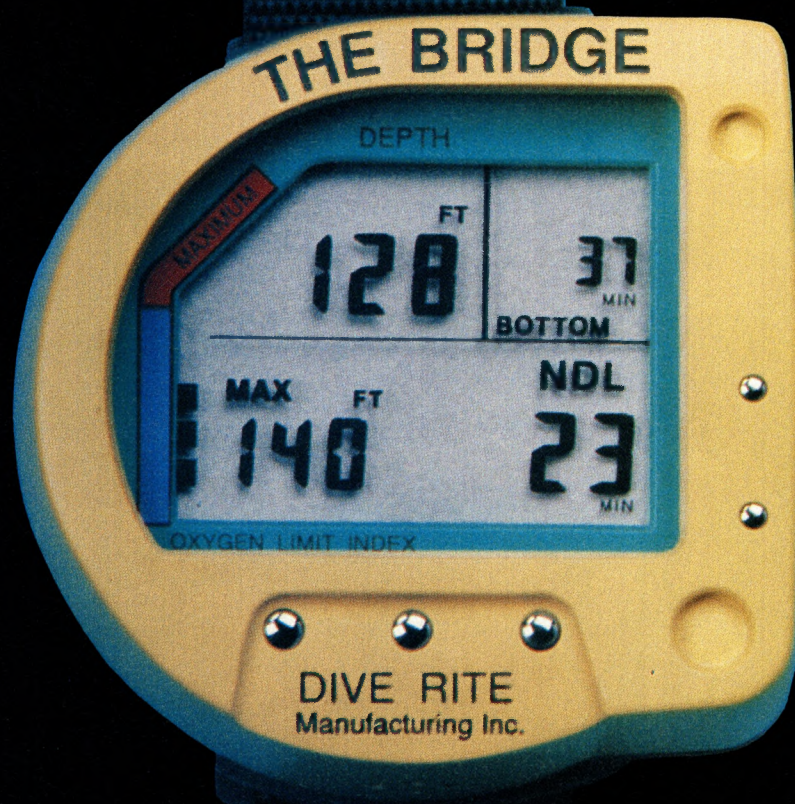
10. Stop the boat — Take the engine out of gear or shut down as divers enter and exit the water.

strapped with 60 pounds of gear. Third, even if the ladder can take the load, it is usually located right next to the engine or outdrive where a slip will find the diver crashing into hard, sharp metal.

With all this said and done, remember that small boat diving doesn't have to be difficult or dangerous. It simply requires a good attitude and a generous use of common sense, all tempered with a healthy respect for Mother Nature. ▀

Explorer and adventurer Tom Turner is an avid small-boat diver.

The Diving Computer of the Future is here Today!



The New Air & Nitrox Computer

Combining the latest in electronics with the **most advanced** decompression theory, **The Bridge™** is not only an air computer, but Nitrox programmable as well. This is a **full function, multi-level computer** that can be programmed from air (21% oxygen) to 50% Nitrox. Oxygen percentages and altitude levels are changeable between multiple dives.



Equipment by Dive Rite. The choice of today's hyperbaric intelligentsia.

117 W. Washington Street • Lake City, Florida 32055 • (904) 752-1087 • FAX: (904) 755-0613

Free information circle 78 on reader service card



The only fin that will make you move faster than ours.



You won't find faster fins on the market than Imprex from TUSA.

Of course, you have to provide the power, but the new Imprex fins are specially designed so you don't have to provide nearly as much.

At TUSA, we're constantly developing new technology. Our revolutionary Imprex line uses materials that didn't even exist five years ago.

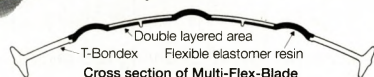
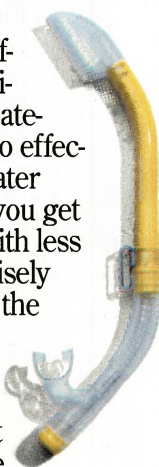
After a great deal of study and research, we

came up with the design for the Imprex fin. It is divided into three separate membranes that flex at different rates. A combination of different materials allows the fins to effectively channel the water while you swim. So you get greater propulsion with less effort. Which is precisely why you wear fins in the first place.

In addition to our fins, we also offer snorkels that are just as revolutionary. The Imprex Hyperdry snorkels do

just what the name implies. The top chamber diverts water away from the barrel, so you breathe air instead of water. And a choice of mouthpiece sizes give you the perfect fit.

So if you're looking for fins or snorkels, look to TUSA. Because really, your greatest fear when it comes to diving or snorkeling should be inferior equipment. And with TUSA, you'll never have to give it a second thought.



TUSA

The future of diving today.

Product Information 1

Leading Edge

Technical diving gear must provide self-rescue ability and a reasonable degree of redundancy.

TECH GEAR

BY TOM MOUNT

Technical diving can be an equipment-intensive sport that requires the diver to carry far more scuba gear than what is needed for standard recreational diving. The complexity and configuration of the gear carried may vary widely depending on the specific application, but there are common elements and requirements that all technical diving rigs should address.

In this article we will first look at the reasoning behind the equipment carried, and then offer suggestions on how to configure and customize a personal gear package.

Technical diving requires more equipment for several reasons including longer dives, dives that incorporate planned decompression stops, dives below the 130-foot mark and dives performed in overhead environments.

While all divers should be self-reliant, it is extremely important that those involved in technical diving are trained to carry and use equipment that provides self rescue ability and a reasonable degree of redundancy.

Gas Supplies—The IANTD standards and procedures document provides a logical approach to gas supplies, stating that: "a sufficient quality of gas must be carried by the diver to allow completion of the planned bottom time, utilizing the gas management rule of thirds. Furthermore, this gas supply must allow for gas matching between divers. In addition, all gas supplies will feature a dual valve outlet to enable two separate regulators to be used during a dive."

Why is there a need for these gas supply requirements? First, the quantity of gas must be pre-planned to enable divers to complete the dive safely. The gas management rule of thirds is applied to create a reserve for emergency contingency plans.

This rule calls for the diver to use one third of the gas traveling or explor-

ing during the dive. Once this initial third is used, the diver will regress to the commencement point of the dive. The second third is used for the return, while the final third is reserved for problems such as a failure of some portion of the scuba system.

Examples would include a regulator going into free flow or a pressure hose rupturing. In such cases, the dual regulator valve plays a major safety function. The diver can shut down the affected regulator, terminate the dive and return to the ascent point using the



Because of decompression hangs and other safety concerns, technical diving is a gear-intensive sport.

remaining functioning regulator.

Another case where the reserve third would be needed is when an ascent is delayed by environmental factors such as becoming entangled in fishing line on a wreck.

It is important to understand that the major purpose in diving the rule of thirds is for self-sufficiency. When the rule of thirds is applied to a dive team, the divers must swim and breathe at their normal rates.

Dive teams must also match gas. If they breathe at different rates or use tanks of dissimilar capacity, there may be insufficient gas to enable a safe ascent.

For example, a diver with a higher breathing rate compensates by using larger tanks. If that diver experiences a gas failure at the maximum exploration point of the dive his or her increased demand on the buddy's tanks will exhaust the gas supply before they reach the upline or the exit point of an overhead environment.

Yes, in open water it could be argued that a less conservative gas rule could be used as divers may ascend directly to the first stop and switch over to their decompression gas. This is true provided the divers always carry all their gases with them. However, even if they can make a safe ascent to the surface, there remains the possibility of being lost at sea.

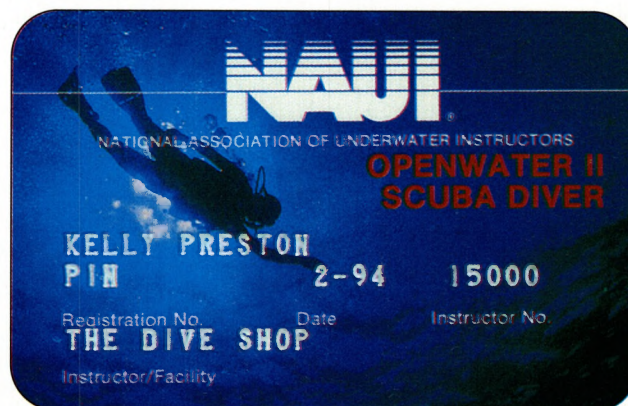
To allow for gas sharing when diving tanks of dissimilar capacity, the divers must modify the rule of thirds to match gas supplies. Gas matching charts are available to calculate these requirements, and a future column will be devoted to the topic.

Required Equipment—To allow divers to share gas, one second stage should be fitted to a hose at least five feet long, with seven feet preferred. This is the only configuration that will allow divers to swim at a normal pace while gas sharing. The standard 40-inch octopus hose restricts the swim pace and posture of the divers, and makes it difficult to maintain contact with an upline or anchor line, especially if current is encountered.

Open water diving requires a lift bag and a line reel to deploy it from. The lift bag and reel have a dual function. The first is to provide a stable platform for ascent with the additional benefit of being a surface marker for the diver's location. The second function is that of a self-rescue device in event of BC failure.

In wreck diving, an additional reel is needed for exploration. In an emer-

With NAUI, your next best teacher...



...is experience.

Designed for new divers who want to gain more experience under the guidance of a NAUI instructor, the NAUI Openwater II course builds water skills and confidence...two things that will make you safer and more competent underwater. And it's a great way to refresh those diving skills if you haven't been active.

To learn more about
our commitment to your quality scuba
education, look for the NAUI logo in your
yellow pages or call
1-800-553-6284.



Free information circle 57 on reader service card

gency situation, this reel would most likely be left inside the wreck, and the second reel could then be used with the lift bag.

To cover Murphy's Law, the wreck diver should also carry at least one secondary light in addition to the primary light.

Cave diving requires at least two reels, but there is no need for a lift bag. The primary light must be backed up by two secondary lights. In addition, line arrows should be carried to indicate the exit direction when making line jumps or other points of possible navigation error on permanent lines.

Knives and, when wreck diving, surgical scissors or wire cutters are also essential parts of the technical diver's hardware. Ideally, these items are placed somewhere on the divers upper body. They should be kept sharp and well maintained because, although infrequently used, when needed the diver's life may depend on them.

Buoyancy Requirements—The most common buoyancy compensation devices used in technical diving are back-mounted flotation systems or "wings" from companies such as Dive Rite, Seapro, Ocean Management Systems and Zeagle. For large-capacity single tank applications, however, many divers prefer to use modified standard B.C.'s (see photo on page 34).

When double tanks are used, some technical divers opt for redundant buoyancy compensators. Many double-tank configurations are negative enough to make it difficult or impossible to surface should a BC failure occur.

But even with tanks that are light enough to surface with, the increased gas consumption may inhibit safe ascent and/or the ability to maintain a stable decompression stop. When using redundant BCs, there is a slight increase in drag and the overall efficiency of the diver will be diminished.

Dry suits are often used as a backup BC. Note! In technical diving the overwhelming majority of participants do not use dry suits for primary buoyancy control because it increases drag and gas consumption.

Most technical divers carry a separate inflation bottle containing four to 10 cubic feet of gas for dry suit inflation, with argon typically being the gas of choice. The suit is then inflated just enough to prevent squeeze and promote warmth.

Many divers feel that the disadvantage of the extra drag outweighs the

safety of redundant BCs. I shared this opinion until I had a BC failure on a cave dive. Since then, I have witnessed other BC failures, including a couple in deep open water. The only reason these divers made it to the surface was because they were equipped with lift bags and had the presence of mind to deploy them.

Some divers also add backups for submersible pressure gauges. Proponents argue that this is the only means of monitoring the gas supply should a failure require the shutdown of the reg-

ulator with the pressure gauge attached.

Dive Tracking and Decompression Equipment—Dive computers, depth gauges and dive timers are usually backed up, as the safety of the dive depends on accurate tracking of bottom time, dive depth and decompression stop time and depth. When dive computers are used, it is recommended that the diver carry a set of submersible dive tables as a backup. Ideally the tables should be of the



Cumbersome decompression bottles are often necessary on technical dives.

Those of us opposed to redundant pressure gauges feel that in the event of an emergency requiring regulator shutdown, the dive should be terminated. At this point on a well-planned dive, one has enough gas to return to the surface, thus the extra pressure gauge is not needed.

Just as with BCs, it is not a question of which is correct, but a personal choice based on how much redundancy is needed versus the complications of

same model as the dive computer.

Most dive computers use the Buhlmann version of the Haldane model. Waterproof Buhlmann tables are available through IANTD. The tables are featured in air, a variety of nitrox mixtures and in trimix versions.

Decompression systems should provide sufficient gas supplies to complete the stops with a minimum reserve supply of one third. Each decompression gas must be appropriately marked as to its use. In addition, it is suggested that

the regulators also be coded and that the mouth piece be protected to prevent accidental use.

Additional tools for specific dives will vary depending upon the objectives of that dive, and will be therefore determined on a mission-specific basis. These will not be addressed in this article.

Sample Configurations—Once we have our necessary equipment, what do we do with it all? A well-planned gear configuration should be streamlined, provide ease of access and be user friendly. Each item should be positioned for quick identification and access by touch alone.

The accompanying photo shows a fairly standard gear configuration for technical diving. It features double tanks attached to a backplate with redundant wings. This particular rig has both inflator hoses coming over the left shoulder, although some prefer to run the second inflator over the right shoulder. Also note that the backup BC has a different type of inflator than the primary BC and the hose is somewhat shorter.

Using this setup, the diver breathes from the regulator with the short hose, thus it's first stage is on the left post. If the supply valve of the left post is bumped closed (a real possibility in tight situations or when brushing against a descent line), the diver will know immediately, and can correct the problem. If he were breathing off the right post, he would have no knowledge of the valve closure until he switched regulators in an emergency situation — which could then lead to a worse problem.

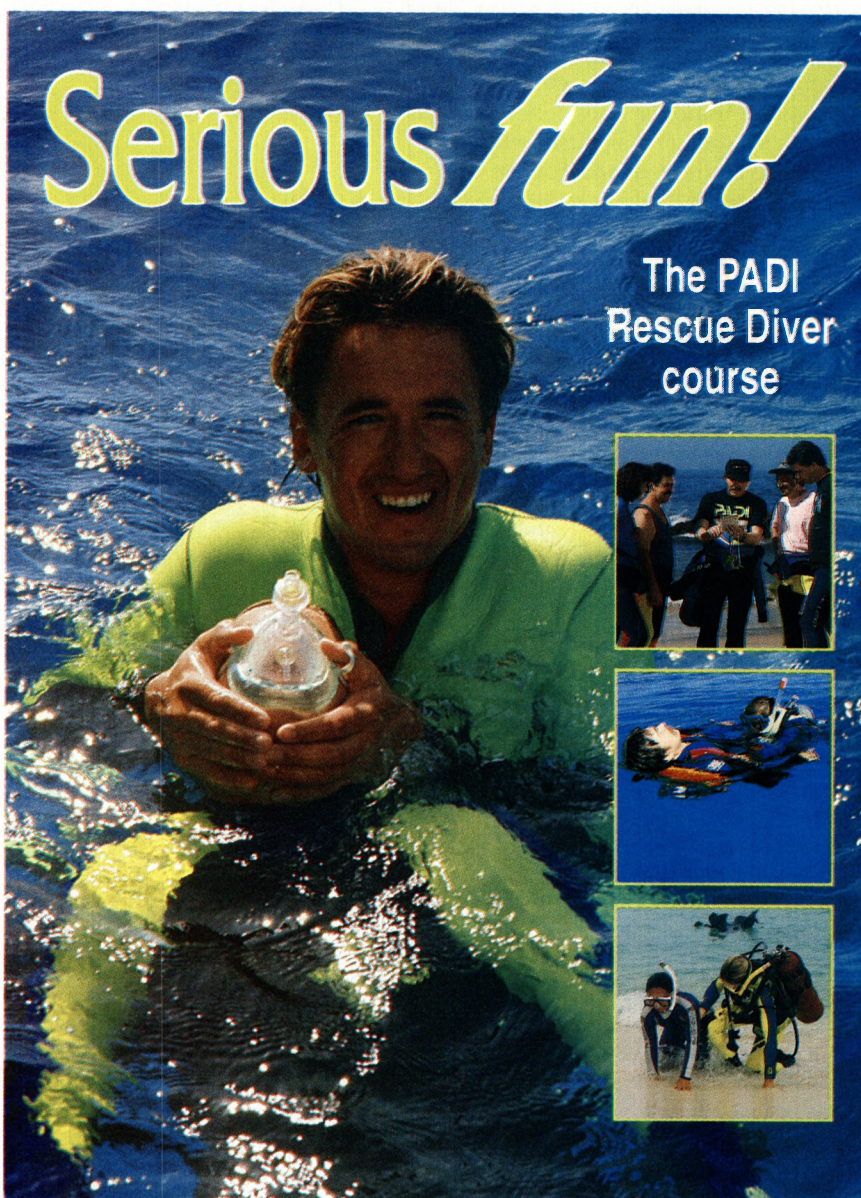
The regulator with the long hose therefore is on the right post. The hose is secured in insertions along the side of the back plate. In this configuration, the hose is protected from chafing, and presents a low drag profile when swimming.

If the diver prefers to breath from the long hose, that regulator should be moved to the left post, and the excess hose can still be stowed in the same manner.

Power inflator hoses are either routed through loops on the BC or snapped to the BC. If a dry suit is used, it can become the backup BC. Often, a shorter inflation hose is used for the drysuit to prevent dangling or entanglement hazards.

Cave or wreck diving back up lights are carried on the shoulder harness. These lights may be attached through a loop and snapped to a D-ring or inserted into neoprene holders.

The primary light in this system is



Learning about accident prevention and problem management is serious, but the PADI Rescue Diver course can also be a lot of fun. Many divers say it's one of the most challenging and rewarding courses they've taken. You'll increase your confidence and diving skills as you learn to anticipate and prevent dive accidents in a relaxed, enjoyable environment.

NOW ON VIDEO!

PADI's new *Rescue Diver Video* shows you the skills and techniques you'll master in the course. It's the perfect complement to the *PADI Rescue Diver Manual*.

Call your PADI Dive Center today to get started!

PADI®

1251 East Dyer Road #100, Santa Ana, CA 92705-5605 USA
(714) 540-7234, FAX (714) 540-7635

Call or write for a free list of PADI Dive Centers worldwide.

Free information circle 7 on reader service card

butt-mounted at the base of the tanks to reduce the drag profile. A secondary advantage of this mounting is that it leaves the upper body less cluttered. This is especially important when managing stage bottles for decompression or penetration.

Different decompression gases are kept on opposite sides to reduce the probability of accidentally switching to the wrong mix at depth. Regulators should be clearly identified and some form of protective device should be in place to prevent their accidental use.

When using multiple stage bottles of the same gas, it is acceptable — and on DPVs recommended — to mount both stage bottles on the same side. This is usually the left side.

The lift bag, when applicable, is mounted at the base of the backplate through loops. There, it has minimum drag, is free from entanglement, and is also quite easy to reach.

When a dry suit inflation bottle is used, it can be mounted on the left side of the back plate. (It may be necessary to change the angle of the dry suit inflation valve.) When diving with wetsuit heaters, the battery may be mounted at the same location as the dry suit inflation bottle.

Safety reels are mounted on the waist D-rings where they are close to the body and pose minimum entanglement hazard. Some divers opt to place the reels on tank D-rings for ease of access — especially when using stage bottles. In wreck diving, however, this creates additional entanglement risks.

All gauges should be as streamlined as possible and attached to the BC or harness to reduce drag and entanglement. Regulators should be held in place with surgical tubing or some other form of keeper. Ideally, all primary second stages (those attached to the permanent mounted tanks) should be located within a triangle zone around the mouth and throat of the diver for ease of access.

Alternative Configurations—Divers who breathe from the short hose can also coil the long hose along the side of the right tank or behind the neck in loops attached to the manifold.

Divers who elect to breathe from the long hose can tuck the excess under a waist-mounted light on the right side or under the waist strap. It is also possible to run the extra-long hose through loops in the backplate or along the manifold, with an additional half wrap



TOM MOUNT



TOM MOUNT

Top: Single-tank, technical BCs incorporate D-rings for attaching gear. Bottom: In double-tank configurations, lift bags and long hoses can be stored in a variety of ways.

around the neck.

Historically, many divers compromised their safety by refusing to carry double tanks. New large capacity single tanks present an attractive alternative for many divers, and these can be configured in many of the ways discussed herein.

Single 100-, 108-, 120- or 140-cubic-foot tanks can be fitted with dual valve outlets to perform many technical dives within safe gas management rules. These tanks have opened up new types of diving to folks who were not physically large enough or strong enough to handle doubles without a risk of injury.

The accompanying photos reflect

some acceptable single tank configurations. The opening example is based on a conventional BC, is adaptable to virtually any tank configuration, and may be interchanged without modifications.

Broader Applications—Although the configurations discussed here were developed for technical diving, there are some applications that could enhance safety in all areas of recreational diving.

For example, one could use dual-valve outlets rather than the standard octopus. The octopus is wonderful for a diver who has a gas emergency and turns to his or her buddy to commence

gas sharing. This system has probably saved numerous lives.

But what happens if the diver is well into a dive at 100 feet and the octopus begins to free flow. In this case, the octopus actually increases the chances of an out of air situation and may prevent a safe ascent. A dual-valve outlet would allow for two separate first stage regulators, giving the diver a personally redundant system.

Another item developed for technical divers that may benefit recreational divers is the use of long second stage hoses for gas sharing. A longer hose is more comfortable and therefore less stressful, and allows divers to swim at a normal pace. A seven foot hose is probably too long, but a hose between four and five feet should be easy to store and manage.

The Perfect System—No single equipment system is perfect for all divers. Combinations of the above referenced configurations are constantly modified by divers, and will continue to evolve as new ideas emerge.

It is easy to become comfortable with a configuration and cease to improve its design, but it is important to continue to look for new ideas and methods to enhance performance and safety.

Even after more than 30 years of technical diving, I still make minor changes in my equipment configuration — three times this past year, in fact. Other divers I know, however, are happy with systems they have used for years, and are equally safe and streamlined.

The most important considerations for safe equipment configuration include:

1. To provide yourself with reasonable redundancy.
2. To keep the dive/drag profile as streamlined as possible.
3. To configure hoses and equipment to avoid damage and entanglement.
4. To be certain that emergency equipment is accessible.
5. To make sure decompression gases are identifiable both visually and by touch.
6. To know the function and location of your and your team member's equipment.

If the above steps are followed, your equipment configuration will provide maximum safety and reliability. The secret is designing a component arrangement that provides personal comfort and satisfies your safety needs. ■

Tom Mount is a veteran cave and technical diver with thousands of logged deep and overhead-environment dives. He currently serves as president of IANTD.

UNDERWATER VIDEO



INTRODUCING THE NEW COMPACT SPORTS CAPSULE

DEPTH RATED — 100M (330 Ft.)
WEIGHT WITH CAMERA 4.5 LB
SONY TR-HI8 SERIES CAMERAS

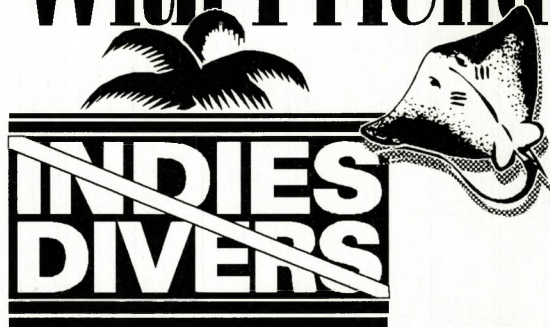
HOUSINGS & LIGHTS AVAILABLE FOR
OTHER 8MM® CAMERAS

FOR INFORMATION CONTACT:

AMPHIBICO INC.
9563 QUEBEC DE LIESSE
DORVAL QUEBEC CANADA H9P 1A3
TEL (514) 636-9910 FAX (514) 636-8704

Free information circle 52 on reader service card

Dive With Friends.



Grand Cayman, B.W.I.

Exclusively for Guests of



- Daily Trips to the North Wall and Stingray City
- Brand New Custom Dive Boat Just Yards Away
- Personalized Attention on an Uncrowded Boat
- Deluxe All - Suite Accommodations with Individual Dive Lockers



Call 1 (800) 654-3130

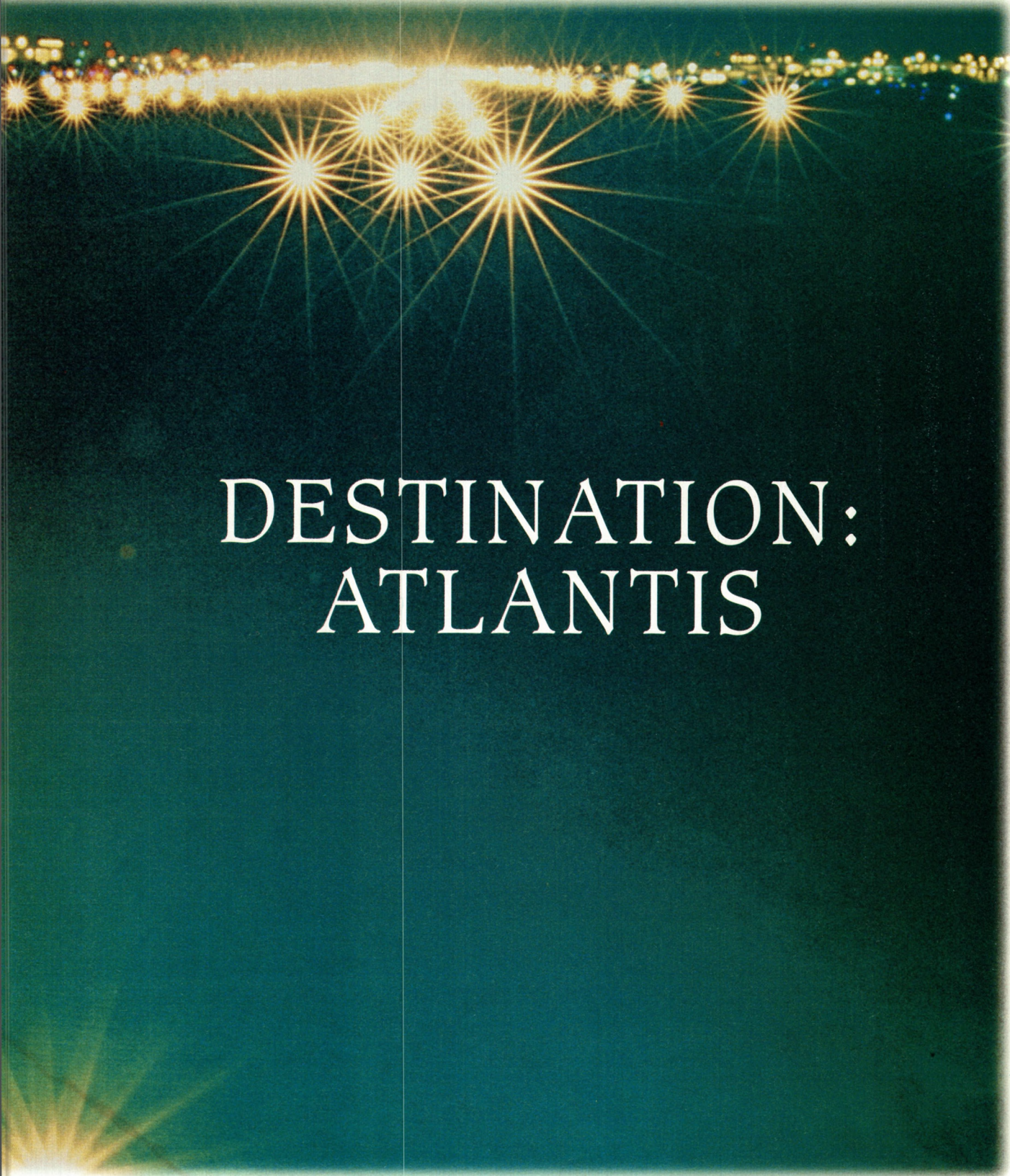
Fax: (809) 947-5024, or Write: P.O. Box 2070, Grand Cayman, BWI

Free information circle 66 on reader service card



The fuselage of the 727 slipped slowly beneath the waves, leaving a trail of bubbles as it made its way to the ocean floor. Although the location of the submerged aircraft was well documented, there would be no search and rescue efforts, no struggling or injured passengers to pluck from the water.

On September 8, 1993, for perhaps the first time in history, the story of an airplane coming to rest on the sea bottom was good news. On that day, the *Spirit of Miami*, an intact Boeing 727-100 commercial jetliner, became the



DESTINATION: ATLANTIS

latest addition to south Florida's extensive network of artificial reefs.

The retired jetliner went to its watery resting place off the coast of Miami, Florida, thanks to the efforts of the Educational Council for Space Age Technology Foundation (ECOSAT) and the Dade County Artificial Reef Program.

This program, perhaps the largest of its kind, has deployed more than 36 large ships along the 35 nautical miles

TEXT AND PHOTOS BY AMOS NACHOUM

of Dade County's shoreline since 1981. By creating new underwater habitat, the artificial reefs program not only enhances the local fishery and reduces user pressure on surrounding natural reefs, but also provides additional attractions for scuba divers.

During its 28 years of commercial airline service, the Boeing aircraft now known as the *Spirit of Miami* served eight airlines including Northwest,



National, Eastern, Carnival and Pan Am. It flew more than 16 million miles carrying some 4.6 million passengers.

In preparation for sinking, the 727 was stripped of its engines and interior fix-

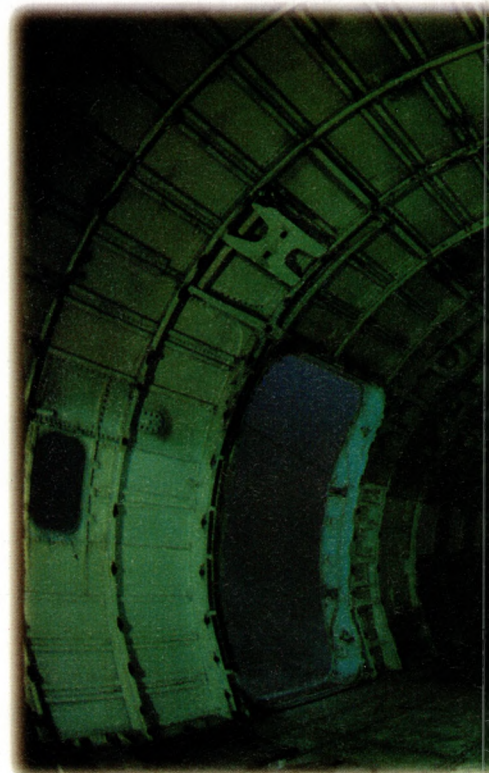
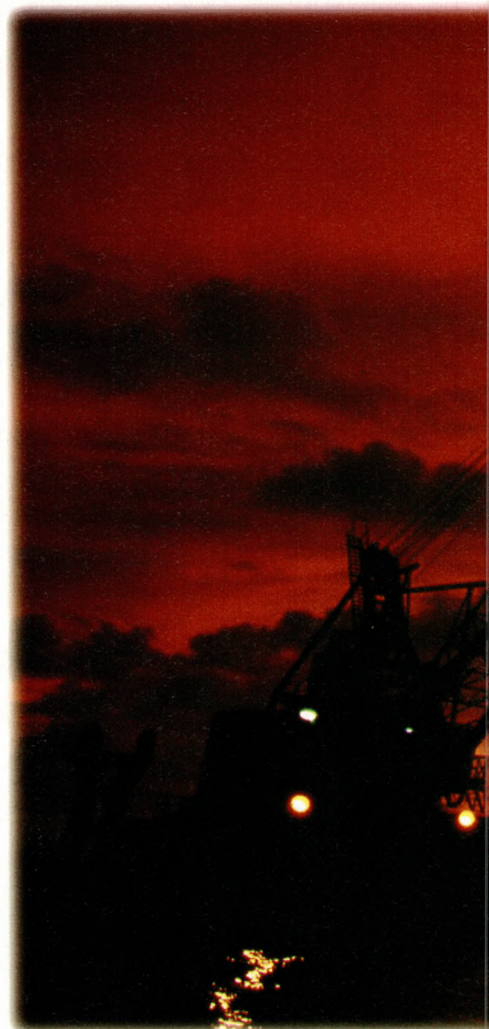
tures including seats, wiring, insulation and fabrics. It was also cleaned of all fuels and oils, leaving an environmentally- and diver-safe skeletal structure.

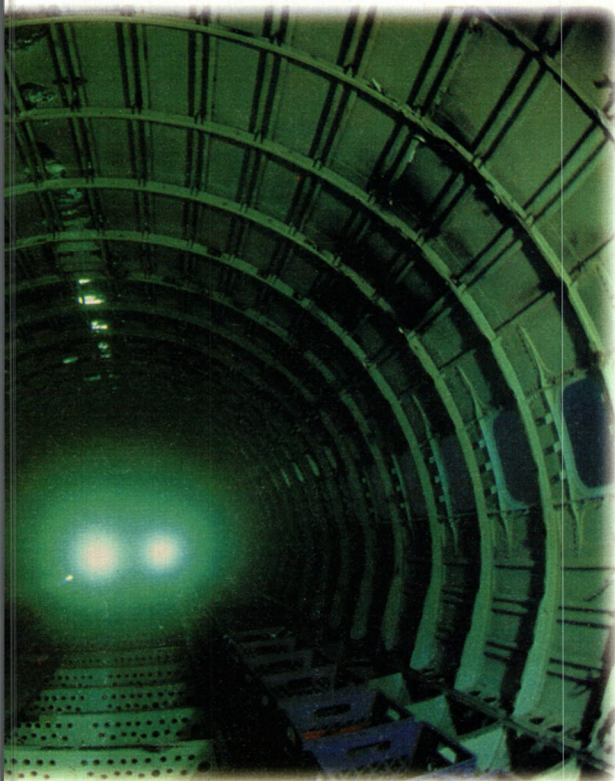
Area students were invited to view the *Spirit of Miami* before its deployment and were able to send underwater science experiments down with the plane in crates specially attached to the fuselage. Previous crew members were also invited to say goodbye to the plane and sign their names on the hull.

The 135-foot-long aircraft was carefully lowered to the sea floor with cables, and was then attached to 10 specialty anchors driven into the sand. Four moorings were also sunk with surface buoys to provide easy access to the boating public, and to eliminate the need for anchors which could damage the aircraft.

The plane has a wingspan of 80 feet, rises 30 feet off the sand bottom and measures 15 feet in diameter. It lies 3 1/2 miles off the coast of Key Biscayne at a depth of 82 feet. Anchored facing south into the prevailing current, the *Spirit* is located between two popular shipwrecks — the *South Seas*, 200 feet to the north, and the *Belcher Barge*, 300 feet to the south.

A number of Miami area dive charter operations make regular excursions to the site, and private boaters are also welcome to use the mooring buoys on a first-come, first-serve basis.





The *Spirit of Miami* lifts off on its last flight. School science projects are the only cargo in the gutted fuselage, and it is now divers who fly through and touch down on this "landing zone."

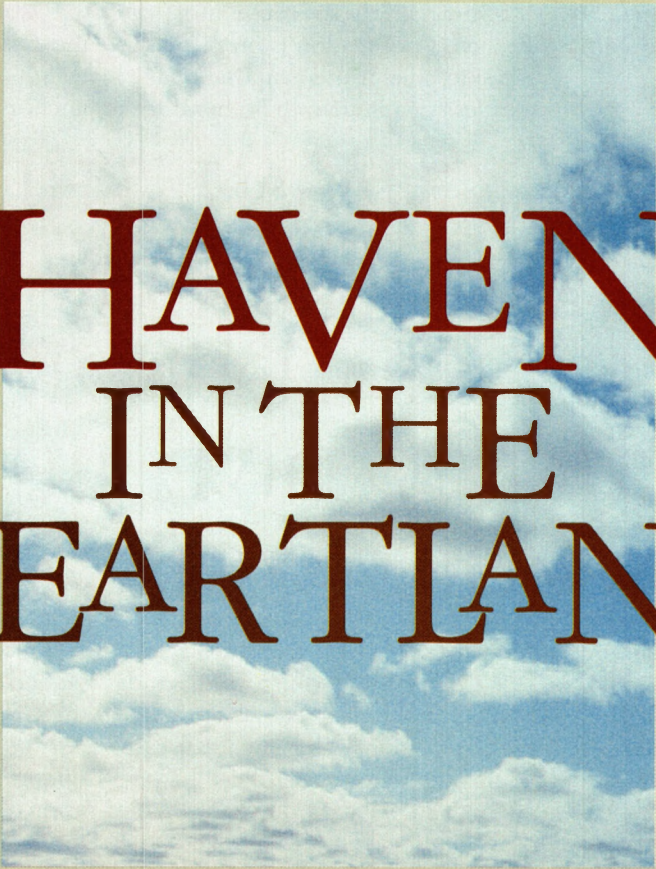




BOB BRODIE



BOB BRODIE



HAVEN IN THE HEARTLAND

Newcomers are often surprised to learn that Michigan has more coastline than any other state. Arriving divers are in for even more of a surprise. With reefs, teeming fish habitats, archaeological treasure troves, caverns, wild river dives, visibility which at times approaches Caribbean levels and shipwrecks which many — even divers from outside the state — feel are the very best in the world, Michigan is a good example of why freshwater diving is one of the fastest-growing areas in scuba.

Accessibility is a Michigan strength. No point in Michigan is more than three hours' drive from a major body of water. The state is composed of two peninsulas which are surrounded by four of the five Great Lakes. In addition, major rivers along the state's eastern border carry some 90 percent of all Great Lakes shipping.

This extensive system, together with literally thousands of inland lakes, rivers, quarries and reservoirs, creates a menu ample enough for even the most selective of divers. In Michigan, the question is generally not what to dive, but where to start.

GREAT LAKES

Literally hundreds of vessels of all sizes have gone to the grave in storms, collisions and fires on the Great Lakes. Once down, as long as they rest beneath the reach of winter ice and wave action, there is little to disturb a Great Lakes shipwreck.

Bottom temperatures in Lake Superior and the deeper portions of other Great Lakes may stay below 45 degrees F — about the temperature of a good cold beer — year-round. This natural refrigeration, together with the low mineral content of Great Lakes water and the absence of shipworms and other wood-borers, means that time passes slowly for the ghosts of the Lakes.

Century-old wooden shipwrecks often look as if they have been on the bottom for a year or less. Steel-hulled vessels rust slowly in the pure, clear lakewater. It is not at all unusual to find painted details on hulks which have rested underwater for decades.

The lake most popular with Michigan divers is Huron, but this is strictly a matter of convenience for the large diving population in the southeastern corner of the state, around Detroit.

The two areas most popular with

wreck divers are Whitefish Point, off the Upper Peninsula, and the Straits of Mackinac (pronounced "MACK-in-awe"), in the area where the Mackinac Bridge ("Big Mac" to Michiganders) joins the Upper and Lower Peninsulas. The Straits were a frequent collision site in the days before radar, and so have the largest concentration of shipwrecks. Whitefish Point late-summer visibility is oftentimes in excess of 50 feet and may sometimes run close to three digits.

LAKE MICHIGAN

Surprisingly, because most of the state's population is on the eastern side, Michigan's namesake lake sees less diving than the other three

ically twice that of the lower lake. The upper lake also offers Traverse Bay, an opportunity to shore dive on a wide variety of wrecks and other features in an area naturally sheltered from Lake Michigan storms.

One of the more interesting Traverse bay features is the "wood reef." Here, beginning near the Traverse City Harbor, the remains of six major dock pilings and 19th-century flotsam document a time when virtually this entire area of Michigan was deforested to provide lumber for rebuilding after the Great Chicago Fire.

Waterlogged lumber remains on the bottom, together with old bottles, ship's-rigging deadeyes, anchors and other remnants of the lumber-shipping trade.

This natural and organic relief provides a home for virtually every type of fish found in the Great Lakes. Many divers make it a point to spend at least one evening of their trip night-diving the wood reef, when the fish come out by the hundreds to feed.

LAKE SUPERIOR

Divers often remark that "Superior" is aptly named. The coldest and deepest of the Great Lakes, it has the best-preserved wrecks in Michigan and offers visibility which can sometimes approach 100 feet.

A downside to Lake Superior is the remoteness of many of the sites.

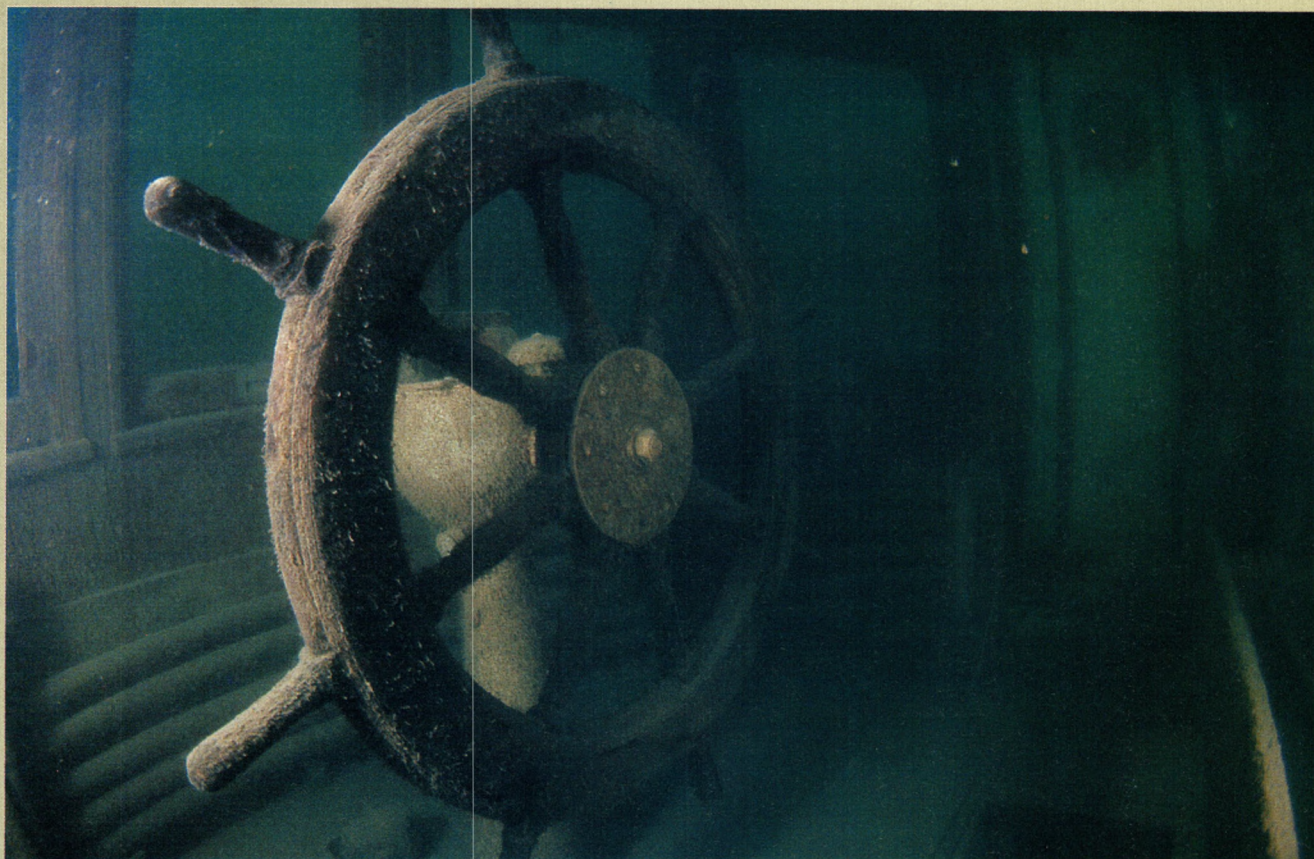
Isle Royale National Park, for instance, is ringed by shipwrecks, but offers no land-based support of any kind for scuba divers. That's why only about 500 divers a year visit Isle Royale. But those who make the trip are rewarded with very clear waters. Wrecks range from the popular *America* (which can be skin-dived near the bow) to the 260-foot deep *Kamloops*, where divers not forewarned will often quickly go through half their gas supply upon entering the engine room and encountering the corpse of a crew member, still in

IN MICHIGAN, THE QUESTION IS GENERALLY NOT WHAT TO DIVE, BUT WHERE TO START.

Great Lakes which front the state. This is a shame because, with sand beaches and long stretches of wave-swept isolation, Lake Michigan can be breathtakingly beautiful.

Wrecks such as the *Rockaway*, near South Haven, the *Ironsides*, by Grand Haven, and the *Ida*, which can be shore-dived near Pilgrim, just north of Frankfort, provide a number of possibilities for divers touring up and down Michigan's west coast. The only downside to diving much of lower Lake Michigan is that prevailing weather blows west to east, so most wrecks end up broken quickly, and visibility is rarely above ten feet.

That's not the case in the upper lake. From Sleeping Bear Dunes National Lakeshore to the northernmost reaches of the lake, offshore islands and bays provide a lee from prevailing winds, so visibility is typ-



LEWIS PANOVICH

SHARING THE TREASURE

Visiting shipwreck hunters are often amazed by the number of artifacts to be found in Michigan waters, particularly on wrecks discovered within the last decade. On Lake Huron's *Regina*, for instance, champagne bottles and brass gauges are among the items which wait on the bottom, even though this is one of the most heavily-dived wrecks in the area. Nearby, the *Sport* tugboat still contains many of the tools used on a working tugboat of its era.

The reason for this completeness is a Bottomlands Preserve Act and an antiquities law which protects items of historic significance on virtually all Michigan shipwrecks. The law is tough — authorities

can confiscate anything used in removing an artifact, including scuba gear and even a boat and trailer — and fines and even jail time are possible for offenders.

This legal injunction against the disturbance of shipwrecks is backed up by an active preservation ethic among local divers. In fact, virtually all of the divers prosecuted under the preservation laws were reported to authorities by other divers. It's a system which has kept Michigan wrecks from "swimming away" one piece at a time.

The prevailing sentiment is to let be those artifacts which nature will allow to endure. In a few areas, such as the St. Clair River, where currents and local con-

ditions rapidly erode wreckage, divers do collect artifacts. This activity is tolerated on the basis that such collection prevents the eventual loss and destruction of these materials by natural forces.

The laws don't preclude collection of modern materials. If you find a mask, a dive light or a freshly lost fishing reel during your wreck dive, you're welcome to stick it in your B.C. pocket. But anything associated with the wreck — even a single nail or a sliver of wood — is required by both law and custom to be left by divers where it was found, on the bottom.

The cold waters and low mineral content in the lakes help preserve the wrecks.

the flesh after 64 years.

East along the north shore of the Upper Peninsula, Black Rocks and Gold Mine Pinnacle are unusual underwater rock formations near Marquette which attract numbers of large game fish and create exciting night-dive possibilities. But don't look for nuggets on Gold Mine Pinnacle, the rock tower gets its name from the

abundance of fishing gear which festoons its crevices, just waiting to be collected by a passing diver.

The Alger Preserve, from Williams and Grand Islands east, is a nice blend of broken wrecks and spectacular scenery, with cliffs and rock pinnacles which drop straight into the lake's clear blue waters. At least one wreck here, the *Bermuda*,

has been taken over by rock bass and perch. Divers who bring fish food will find themselves in clouds of fish similar to what one might expect on a dive off Grand Cayman.

The cliffs which form the coast of the Alger preserve are limestone. Since this rock is soft and easily eroded, caverns have formed beneath the waterline in many places, and local

charter captains can take you to sites where cavern walls are sculpted in a virtual map of the geologic eras which created them.

The mother lode of Lake Superior diving, however, has to be the waters around Whitefish Point. Here, scores of ships have gone to the bottom in decades of storms and collisions. While many are deep enough to require mixed-gas and decompression training, others, like the *Vien-na* (125 feet to the deck), the *Panther* (110 feet) and the *Myron* (50 feet) offer enjoyable dives for advanced sport divers.

Be prepared for an international experience. The area attracts both American and Canadian divers, and it's not unusual to run into buddy teams from England, Germany or other European countries — the wrecks are that well-known.

In recent years, much conjecture has been raised and at least two expeditions have been organized to put technically trained sport divers on the wreck of the *Edmund Fitzgerald*, which went down 17 miles off Whitefish Point in November of 1975. Given a window of calm weather and the right equipment, it is now felt that the "*Fitz*," which rests in 535 feet of water, is within the reach of specially trained divers.

LAKE HURON

Lake Huron was ground-zero for a great storm which struck the Lakes in 1913, sinking scores of vessels and taking more than 200 lives. Some of the boats (a vessel built for Great Lakes service exclusively is called a "boat" regardless of its length) were located within days after the blow.

The *Charles S. Price*, for instance, floated for about a week off Lexington after capsizing, and upon sinking was salvaged by hardhat divers. Access to the wreck's hull is

still made through holes created during the salvage operation.

Further north, between Lexington and Port Sanilac, the *Regina* (pronounced Re-jie-na) remained hidden in 80 feet of water from 1913 until 1986, when it was discovered by sport divers. Thanks to an underwater preservation law passed six years earlier, the *Regina* remains in near-pristine condition, containing champagne and wine bottles, machinery, tools, barbed wire and other cargo, as well as virtually all of the fittings. Today, the site is visited weekly during the summer season by commercial charters.

Two of Lake Huron's most interesting wrecks went down with-

IT'S NOT UNUSUAL TO RUN INTO DIVERS FROM ENGLAND, GERMANY OR OTHER EUROPEAN COUNTRIES.

in a few miles of each other off Grindstone City. The Dunderburg, which sank in 1868, sits upright on the bottom, with part of her masts in place. The hull is mostly intact, and divers who penetrate the galley area will find china and jars of 125-year-old preserves. The most unusual feature of the Dunderburg is a carved figurehead, apparently a crocodile carved by a man who had only heard crocodiles described.

A few miles away, also sitting plumb upright, is the bow of the *Daniel J. Morrell*. The *Morrell* broke in two in rough seas in 1966; the bow sank almost immediately, while the stern continued on, under its own power, for several minutes before slipping under the waves itself.

Nearly thirty years after its sinking, the *Morrell's* wheel is gone, but most other fittings remain. The wreck's mast is reached at 100 feet and the hull rests on a 200-foot bottom. The pilot house is 145 feet deep and her letters, white on a red hull, can still be seen by divers who wish to drop to 165 feet to view them. To dive the rest of the boat requires a separate trip — the stern rests five miles away and requires a 190-foot dive just to touch the wreckage.

INLAND LAKES

While some Michigan divers think of the hundreds of inland lakes merely as nurseries in which certified divers are grown, many people dive inland water year-round, both to keep up their skills and to enjoy features unique to various lakes.

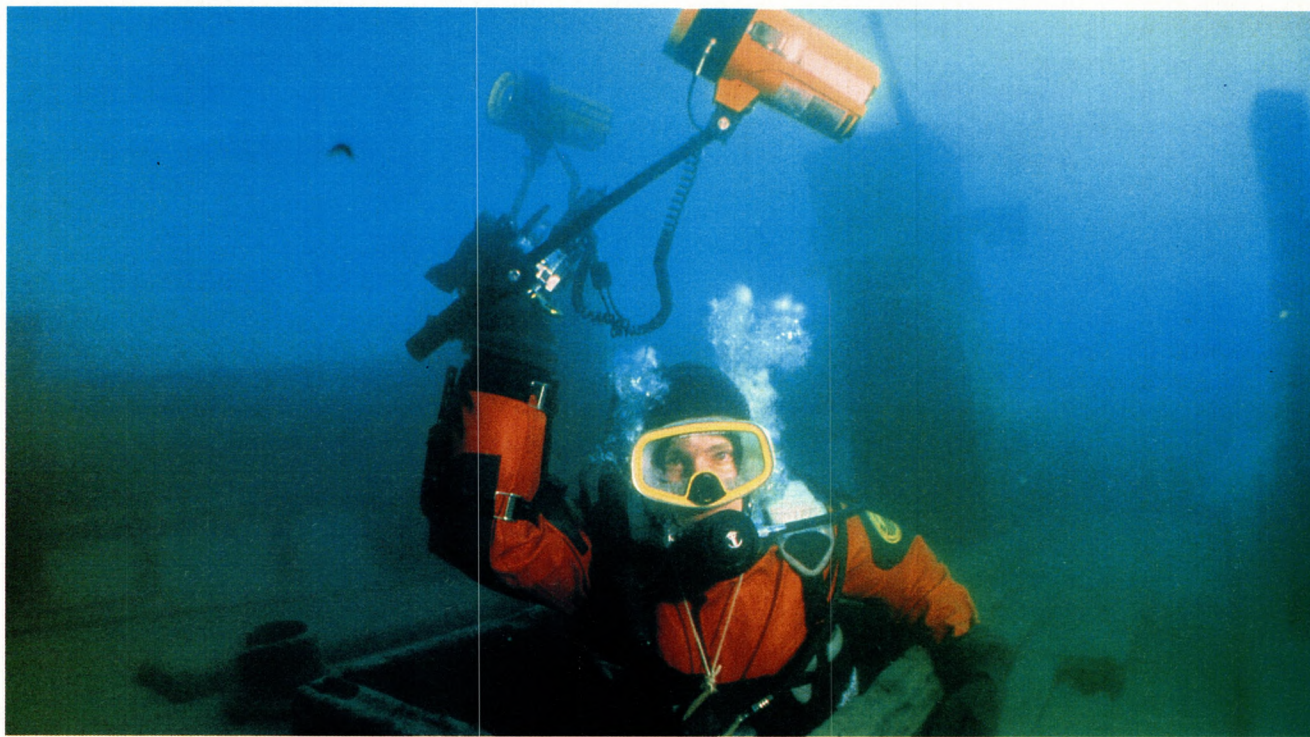
Inland Quarry, an abandoned stone quarry in the Upper Peninsula, flooded after it was no longer worked. Much of the stone-cutting machinery and even some small buildings remain in the clear water, which never gets more than 25 feet deep. This is a good place to check out rusty dive skills before venturing

into nearby Lake Superior.

Higgins Lake, south of Grayling, was once named by National Geographic as one of the most beautiful lakes in the world. That triggered a spate of shore development which now sometimes make it hard to see the lake from the road. But for divers, the attraction here is underwater visibility, which will exceed 50 feet in late summer.

Some people who shore-dive here may complain of "great visibility but nothing to see." Actually, there's plenty to see — logjams, rock piles and a "sunken island," all of which teem with photogenic fish — but it takes a boat to get to these sites.

Little Stoney Lake, stone-bottomed from its beach down to the



The abundance of wrecks and marine life present many photo opportunities in the Great Lakes.

25-foot level, is where many Detroit divers come for their open-water checkouts. A sailboat, two powerboats and a swim-through steel tank provide amusement for divers trying out their skills. For divers working on their advanced ratings, there is also a permanent underwater compass course and a fish habitat of suspended tires which doubles as a buoyancy-control "obstacle course." Entrance to the lake is at the private Stoney Lake Swim Club, where visiting divers are welcomed for a modest (\$3.00) daily usage fee.

RIVER DIVING

A variety of Michigan rivers, including the St. Mary's River near Sault St. Marie, and the Black River near Port Huron, offer good diving at various times throughout the year. But the two most popular river dives in the state remain the Boardman River, which runs through Traverse City, and the St. Clair, which drains Lake Huron and runs between Port Huron and Sarnia, Ontario.

The Boardman is a swiftly flowing, gravel-bottomed river which averages six to eight feet in depth and rarely gets deeper than 15 feet. The shallow diving — so shallow

that one of the first challenges is getting your computer to turn on — rewards the diver with bottom times measured virtually in geological eras, a variety of artifacts, and enough visibility and light to allow underwater photography without the use of a strobe. It offers a nice alternative when weather conditions have "blown out" the diving in nearby Lake Michigan and Traverse Bay.

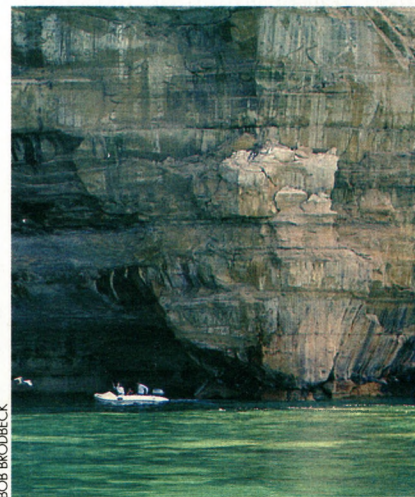
Most Boardman dives begin or end near a spillway dam off Union Street, just south of the Traverse City post office. A fishing dock below the spillway offers a convenient entry point.

Bass, perch, turtles, crayfish and relatively rare blue pike are among the fish to be encountered on a typical Boardman drift. Trout are seen during the cooler months, and during the spring runs, divers sometimes report that it's almost impossible to dive the Boardman without colliding with coho salmon making their way upstream to spawn.

The St. Clair River has served for two centuries as the crossroads of the Great Lakes shipping system, offering the only entry for interlake shipping into lower Lake Huron. Downbound boats, heading out of

the lake and into the mouth of the river, have to contend simultaneously with a narrow shipping channel and a vigorous four-knot current. The result over the years has been a great number of collisions and groundings, as well as loss of cargo and loading machinery from the decks of passing freighters.

Much of this debris remains on the bottom. Divers excavating on the century-old *M.E. Tremble*, which lies just downstream of the international Blue Water Bridge, have recovered



Pictured Rocks is just one of the breathtaking topwater sights in Michigan.

china, pocket watches and tools, and are still finding artifacts today.

Upstream of the *Tremble*, 19th-century grindstones and a boom from a self-unloading crane provide something interesting to both examine and hang onto in the lively, tear-the-mask-off-your-face current. Downstream, the current falls off a knot or so, making it possible to hang onto a rock with one hand and fan with the other in the gravel and sand for the patent-medicine bottles and other brickabrack often found here.

During the latter part of the 19th century and the early part of this century, excursion boats traveling up into Lake Huron would just be cleaning up after dinner as they passed this part of the river. Stewards would discard any cracked or broken china overboard as they neared the river's mouth, and divers often find these remnants of a bygone era — together with the occasional intact china tossed overboard by mistake — on the river bottom.

Spring and early summer are when fish life is at its most abundant in the St. Clair. While sheepshead and walleye pike (known locally as "pickeral") can be seen in the St. Clair year-round, they are more abundant in the spring, and are joined by a variety of bass, as well as schools of alewives which will stream by for several minutes at a time. The schools of baitfish are often accompanied by gamefish

which will feed actively within arm's reach of a scuba diver.

During June, divers drifting near the channel will have the opportunity to see sturgeon, the largest fish in the Great Lakes (several feet in length), which are frighteningly prehistoric in appearance, although shy and harmless to divers. Divers overturning rocks as they artifact-hunt on the bottom are sometimes surprised to look up and see that they are being tailed by large striped bass. These fish become doglike and friendly as they feed on the crayfish exposed by the diver's passing.

The St. Clair is a major shipping artery, so watercraft of all sizes, from

small sailboats to 1,000-foot lake freighters, are constantly plying its surface. Because of this, divers consider the St. Clair to be an overhead environment, in which surfacing is safe only adjacent to the seawall.

This, together with the typical St. Clair entry — which involves clamoring over a handrail in full scuba gear and then making an eight-foot leap into the swift current — and variable visibility (anywhere from 0 to 30+ feet) makes this area ill-advised for novice divers. In addition, divers new to the area will usually want to keep within sight of the seawall on their first dives, growing accustomed to the current before venturing into the eddies and potential entanglement hazards which wait in the deeper portions of the river.

Michigan diving may take a little planning, and a well-insulated wet (or dry) suit, but the preparation is generally well worth the effort.

Divers visiting the St. Clair and the Great Lakes wrecks are wise to make their first dives on these sites with someone who knows the waters and their quirks. Local scuba shops are a good source of such expertise; the services of a divemaster can add to both safety and enjoyment of a new site, and the knowledge gained is usually well worth the cost. ■

Jean Pierce, of Napa, CA, and Tom Morrissey, of Romeo, MI, are travel writers and photographers who specialize in exotic and advanced diving.



DAVID CHUR

Most Michigan divers own Lycra and Darlexx diveskins — they use these for their winter trips to the Florida Keys and the Caribbean. For Michigan diving, even during the height of summer, a full wetsuit is usually de rigueur.

This may seem odd at some inland lakes, where swimmers and waterskiers frolic in Speedos and bikinis. But swimmers rarely venture beneath the thermocline. On virtually any Michigan dive in calm water, the diver is going to pass through this barrier, beneath which the temperatures may be 20 degrees F cooler or more than that of the surface water. Our log-books show bottom temperatures of 42

IS IT COLD?

degrees F for Lake Huron in late July.

Inland divers generally use 1/4" wetsuits for summer dives, bolstering these with gloves and hoods at either end of the season. Ice divers and Great Lakes divers favor dry suits, and deep divers in Michigan have taken to the somewhat contro-

versial practice of connecting their dry suits to an argon bottle, rather than their breathing tank, to take advantage of that gas' better insulating qualities during decompression "hangs."

In all, summer temperatures around Michigan are generally comparable with those of California waters, but, since Michigan water is fresh, divers will need less weight than that required with equivalent gear in salt water. Seen this way, Michigan diving is far more hospitable than the hair-shirted image usually presented by its practitioners.

Full wetsuits or drysuits are a must for Michigan diving.



it's a day
at the beach!

The best mix of competitive sports action and plenty of on-land activities for spectators. Bring your beach towel and lawn chairs.

See pro slalom skiers, distance jumpers and freestylers as they compete for over \$400,000 in prize money.

It's a full weekend of events featuring product demos, sweepstakes, exhibitions, music, food, beach volleyball and the World's most exciting sport, SCUBA DIVING, brought to you by Mares.

City	Location	Date
Orlando, FL	Barnett Park	April 16-17
Chicago, IL	Lake Park	June 11-12
Indianapolis, IN	The Precedent	June 25-26
Hartford, CT	Batterson Park Pond	July 9-10
Shreveport, LA	Champion Lake	July 16-17
St. Louis, MO	Creve Coeur Lake	July 30-31
St. Paul, MN	Keller Lake	August 6-7
Portland, OR	Blue Lake Park	August 20-21

Cost: \$9 for adults and \$4 for children under the age of 12.

For advanced tickets call
1-800-394-6006*

Budweiser
KING OF BEERS®

*For the Orlando event:

Buy Tickets Now at **TICKETMASTER**
in Sound Warehouse, Sports Unlimited,
Spec's, and the Infinite Mushroom (407)839-3900

*For the Chicago event:

TICKETMASTER
CARSON PIRIE SCOTT/ROSE RECORDS/SOUND
WAREHOUSE/TOWER RECORDS/HOT TIX
(312)559-1212



SPORT
DIVER



Sex

by Doug Perrine

and the

People may think me odd,

single



Scleractinian



but I like to look at life from the point of view of other animals.

For example, a polyp (a single coral organism) may look a bit different from you and I, and have fewer appointments scheduled on its calendar, but it has basically the same three big concerns as all the rest of us: survival, growth, and reproduction. (Fortunately, taxes are not yet a major worry for most other creatures.)

Whether by cunning or by blind evolutionary selection, every living thing must solve the problems of feeding and growing — while avoiding becoming a meal for something else — and then pass its genes on to future generations.

Scleractinians, or stony corals, have evolved a remarkable suite of solutions to the first two problems, including their shared, fortress-like skeletons, tentacles loaded with venomous harpoons and internal vegetable gardens. But all of these advanced lifestyle features, while guaranteed to impress the neighbors, are of little value if they can't be passed down to the grandchildren.

The sedentary habits of these “couch-potatoes-of-the-reef” make sex a thorny issue, but they have come up with an amazing variety of strategies for getting their gametes together.

The question arises whether sex is even necessary. After all, corals do an excellent job of reproducing themselves “vegetatively” by cloning. Each coral head is composed of many individuals which are genetically identical, and arose by budding off of a single polyp which founded the colony. Colonies can be hundreds of years old, and could possibly obtain ages into the thousands if environmental conditions were sufficiently stable.

While immortality could be a theoretical possibility for corals, experience with cell and plant cultures suggests that, even apart from the shortage of beer and televised sports underwater, there are limits to

This sponge, *Ectyoplasia ferox*, like some corals, releases its eggs into the water.

ALL PHOTOS: DOUG PERRINE ILLUSTRATION: BRENDA WEAVER

how long you can get by without sex. As rose cultivators and lab scientists have discovered, viruses and genetic mutations tend to accumulate over time, limiting the viability of any line of clones.

Sex is also necessary to reshuffle genes and maintain adaptability to changing environmental conditions, and, in most cases, to produce free-swimming larvae which can colonize new habitats.

SIZE MATTERS

Corals which grow to a large size often postpone sex until the

colony has reached a large enough size to survive storms and other natural disasters, preferentially investing energy in vegetative reproduction, which increases colony size. When mature colonies have been experimentally broken into small pieces, they reenter celibacy — proving that it is size, and not age, that is the determining factor.

Eventually, even the most reluctant coral must recognize the inevitable, and find a mate. This can be a real dilemma when you live with your parents, have no car and have your rear end glued to the

couch (not to mention the social stigma of eating fish feces for breakfast, and having your anus on your face).

Barnacles suffer from the same lack of mobility, but have creatively overcome their shortcomings by developing male organs that would make John Holmes turn green with envy (in fact, proportionately the longest penises in the animal kingdom). These are quite able to reach out of the animal's shell and into its neighbor's. For added insurance, each barnacle is both male and female, able to receive as well as to give.

For most corals, however, such shenanigans would be worse than incest. Since all of the neighbors are genetic clones, it would be like doing it with yourself. Therefore, corals, like other sessile organisms such as sponges and clams, have become dependent on water currents to carry their gametes to potential partners.

Amongst the great diversity of schemes for getting male and female cells together in the scleractinia, there seem to be four major categories:

1. Corals which have both male and female organs in the same animal (hermaphrodites), and which "broadcast" their spawn into the water, with fertilization taking place externally, in the sea water.
2. Hermaphrodites which release sperm into the water, but retain the eggs within the body. Fertilization takes place internally, and the embryo is brooded until it reaches the planula stage (a ciliated swimming larva), when it is released.
3. Corals with separate sexes (gonochores) which broadcast both sperm and eggs.
4. Gonochores which brood. Among the hermaphrodites, there are simultaneous hermaphrodites, in which male and female gonads ripen at the same time, and sequential hermaphrodites, which do first one, then the other. A few species brood asexually-produced planulae, but these are perverts, and we won't mention them again.

The variation in modes of reproduction has even turned out to be useful in classifying species. *Sideras-*



The "smokey" appearance of this brown sponge, *Agelas species*, is caused by the release of sperm. Sponges and clams also rely on water currents to disperse their gametes.

trea siderea and *Siderastrea radians* had been reclassified as a single species until it was discovered that *S. siderea* is a broadcaster and *S. radians* is a brooder.

NIGHT MOVES

When I first learned to dive, and became interested in marine biology, in the early '70s, it was widely assumed that all corals were brooders, which released planulae at frequent intervals, and I never heard any other mode of reproduction mentioned. In the late '70s, scientists began examining coral tissues microscopically on a systematic basis and discovered that in a number of species, gonads developed over a period of months, and then suddenly disappeared — an odd pattern for something that is supposed to be brooding larvae throughout the year.

Broadcast spawning was dramatically confirmed as the dominant mode of coral reproduction when the mass spawning of corals on Australia's Great Barrier Reef was discovered in 1982. It had never been noticed before because it happens at night — and a little bit later than most night divers are out.

The most common reproductive mode among those corals which have been studied (still only a fraction of the many species of coral in the world) is simultaneous hermaphroditic broadcast spawning. This is the pattern employed by the dominant reef-building coral in the Caribbean, boulder star coral (*Montastrea annularis*).

Having cleverly gotten around its lack of either a car or a long male member by learning to cast its wild oats into the currents, the boulder coral still has a number of things to worry about. First of all, it doesn't do any good to cast your seed into the wind unless there's someone else's seed blowing around out there too.

While some brooders planulate monthly, broadcast spawners generally only do it once a year. Therefore it's critical to coordinate the timing of gamete release so that all the colonies do it at the same time. This coordination is effected by cueing in

to both the season (solar cycle) and lunar phase, prompting the scriptwriter for *Jewels of the Caribbean Sea* to note that "the largest living structures on earth [coral reefs] are controlled from outer space."

Eventually,
even the most
reluctant coral
must
recognize the
inevitable and
find a mate.

The gametes are released as little pink bundles containing both eggs and sperm. The bundles float upwards to the surface where they break apart, and the individual cells must find a partner of the opposite gender to fertilize within a day or so.

Before they can worry about that, though, they must avoid being eaten. One of the advantages of spawning at night is that most of the egg-eating fish on reefs (damselfish and wrasse) are asleep, and the eggs are less visible as well. However, when the corals spawn, schooling pelagics seem to materialize out of nowhere to gorge themselves on the bounty and brittle stars climb up on top of the corals to feast on the egg bundles as they are released.

THE SCLERACTINIAN SEX DOCTOR

As if all that wasn't enough to worry about, then there's Dr. Alina Szmant and her little tents. Imagine

the consternation of a coral head in the Key Largo National Marine Sanctuary.

Having prepared all year for the big orgy, watching the moon every night until it knows that tonight is its big chance to get lucky, and then.... Here come Dr. Szmant and her graduate students from the University of Miami, erecting a tent net right over the head to catch all the spawn before it can get out and mingle with the produce of the nice coral heads from the upper side! The samples are whisked back to the research vessel and mixed with samples from other carefully selected coral heads.

There are a number of things that Dr. Szmant hopes to learn from such experiments. For example, what keeps the eggs from being fertilized by the sperm from the same bundle? And what prevents cross-fertilization by different species? *M. annularis* has three or four distinctive growth forms.

Dr. Szmant is among the scientists who suspect that these may actually be different species. By carefully mixing the spawn from heads of different types and watching to see if fertilization and development take place, it may be possible to settle the matter.

For Szmant, it was a 17-year journey to get to the point of collecting samples from corals spawning on the reef. Lab work on a small coral found in the cool waters of Rhode Island in the '70s showed that it did not conform to the brooding/planulating pattern then believed to be the norm, but instead released its eggs for external fertilization.

Working out of the marine lab of the University of Puerto Rico in the early '80s, her team took samples of 11 species of Caribbean corals every two weeks and dissected them to see what was happening with the gonads. Some interesting patterns began to emerge.

The five species which were brooders were smaller corals, and tended to live in shallow parts of the reef, making them susceptible to sudden early mortality by storms.

Szmant hypothesized that brooding might provide more efficient recruitment of the larvae to the immediate habitat where the adults were found.

The more massive corals tended to be broadcasters. They were more likely to survive storms and would perhaps not need to recolonize their immediate habitat, and might be better served by exporting spawn to colonize more distant habitats.

THE BIG NIGHT

The lab work showed that most of the broadcasters would be spawning in late summer, but it wasn't until researchers from James Cook University in Australia reported the discovery of mass spawning on the barrier reef that Szmant realized it would take place after dark.

During the summers of 1985-86 she had divers out every other night July through September. They witnessed spectacular spawnings of brittle stars and sea worms, and even collected ripe staghorn coral which spawned in the lab, but the "big event" still eluded them.

Finally, in the summer of 1990, while conducting round-the-clock coral physiology studies in the Bahamas, Szmant and her student

They had missed this spectacle in previous years because they had gotten out of the water too early. At the same time, some sport divers

For simple
gut-sacs
surrounded by
tentacles,
these creatures
lead very
complex lives.

on the *M/V Fling*, diving on the Flower Gardens reefs in the Gulf of Mexico were astonished by some chance observations.

Just before sunset, some

the water into a thick soup.

Comparing observations from Australia, the Bahamas and the Gulf, Szmant predicted that spawning would occur the following year during the third quarter of the August moon. The Flower Gardens National Marine Sanctuary manager, Steve Gittings, assembled a team of researchers, and the next two years they were waiting when the Flower Gardens reefs put on a spectacular display, starting with sperm release by *M. cavernosa*, followed by the release of white gamete bundles by the brain coral *Diploria strigosa*, then pink bundles by *M. annularis*, more sperm and eggs by *M. cavernosa*, and sperm release by blushing star coral, *Stephanocoenia michelini*.

They also saw spawning by brittle stars, Christmas tree worms, wrasse, and boxfish. In 1993, mass spawning of Western Atlantic corals was captured on motion picture film for the first time when Howard Hall filmed the event at the Flower Gardens for the National Geographic special, *Jewels of the Caribbean Sea*. Hall described the reef as looking like "a big wet dog shaking itself off." Since all of the major reef-building corals in the area were participating, this was a true mass-spawning.

MATING SEASONS

Meanwhile, Szmant and her team, working with John Halas in the Key Largo sanctuary, were seeing only a coordinated spawning of the single species, *M. annularis*, demonstrating that this, like other biological processes, can be extremely variable. True mass spawning, involving over 100 species of corals, occurs on both coasts of Australia, but in different seasons — fall in western Australia and spring on the east coast.

Even within the Great Barrier Reef, the timing of the event varies from north to south, and also between nearshore and offshore reefs, so that it may occur anytime from October to February, depending on the location. Outside of Australia, even in sites as close as New Guinea, coordinated



Dr. Alina Szmant of the University of Miami studies coral spawning.

volunteers witnessed an unforgettable sight: pink underwater blizzards, as first the staghorn corals, and then the star coral erupted in perfect synchrony, spewing their spawn into the water on three consecutive nights.

colonies of giant star coral, *Montastrea cavernosa* (a gonochoric broadcaster), began "smoking" as the male colonies released sperm. A few hours later, corals began releasing eggs and gamete bundles "as far as you could see," turning

spawning between many species is not known to occur. For that matter, even the 130-some species that participate are only a minority of the 350-plus species of hard corals that occur on the Great Barrier Reef. For most of the rest, the spawning cycles are still unknown.

This begs the question of what advantage various types of corals, and even unrelated creatures such as sea cucumbers, sponges, worms, and sea stars, gain from coordinating their reproductive cycles to all spawn on the same few nights.

The most widely proffered explanation is that survival of the offspring is increased by oversaturating planktivores which feed on the eggs. Examinations of the stomachs of plankton-eating fish during mass spawnings have cast some doubt on this explanation, which also fails to answer why only reefs in selected areas seem to exhibit this phenomenon.

It still seems the most likely explanation, however, and scientists believe that there must be some distinct benefit to overcome the disadvantages of mass spawning, including the danger of fertilization by inappropriate sperm and increased competition for larval settling sites.

The question also arises as to how the corals sense the correct lunar and solar phases to coordinate with, since they have neither eyes to watch the moon nor the Weather Channel to keep them informed. The most likely candidate for annual timing is water temperature.

Water pressure has been proposed as the cue for the lunar phase, since it is dependent on the tides, which are controlled by the moon. However, lab experiments have shown that, at least for a couple of species, it is the amount of moonlight which regulates spawning. The question of how the corals measure the moonlight has not been answered.

Another mystery is why corals tend to spawn on neap tides (periods of minimal tidal fluctuation) and often on low or incoming tides, while many fish spawn on outgoing flood



This star coral, *Montastrea annularis*, releases gamete bundles which will break apart into eggs and sperm at the surface.

tides, an adaptation to sweep the larvae off the reef, and away from the high concentrations of planktivores which occur there. The answer may be that water mixing is reduced during low, neap tides, keeping concentrations of gametes higher, which might increase rates of fertilization — but the corals aren't talking.

For simple gut-sacs surrounded by tentacles, these creatures lead very complex lives, exhibit remarkable abilities and hold a lot of secrets. While unraveling some of their mysteries may take years of work by dedicated scientists such as

Szmant, chances are that, as at the Flower Gardens, many of these secrets may be discovered by ordinary sport divers armed with video cameras. 

Doug Perrine has a background in the marine sciences and now works as an underwater photojournalist. After reading this article, we are concerned that he has spent too much time in underwater voyeurism recently, and should be encouraged to surface and head for a nightclub in search of human companionship.

OVER THE EDGE



Gary Gentile pushes the frontiers of wreck diving

Deep brown eyes, shaded behind a mask whose black color is of questionable origin, inquire without words. Repositioning my camera and responding with a nod I watch as Gary Gentile takes a final step and plummets downward into the green Atlantic.

The water swallows him leaving a swirling ring of white foam and a trail of bubbles. Full, sweeping kicks propel him downward with the grace and speed of a dolphin; his goal, a sunken shipwreck awaiting exploration.

By Barb Lander

RIGHT: BRAD SHEARD LEFT: COURTESY OF BARB LANDER



Gary Gentile hits the water on the first-ever trip to explore the *Norness*.

Gary Gentile has been exploring shipwrecks for more than twenty years. Fewer names are more widely known and respected among wreck divers.

His explorations have taken him from the warm waters of the Caribbean and Florida to the frigid depths of the Saint Lawrence Seaway, the Great Lakes, Nova Scotia

and, of course, the coastal waters of New York, New Jersey and North Carolina — the bastions of wreck diving.

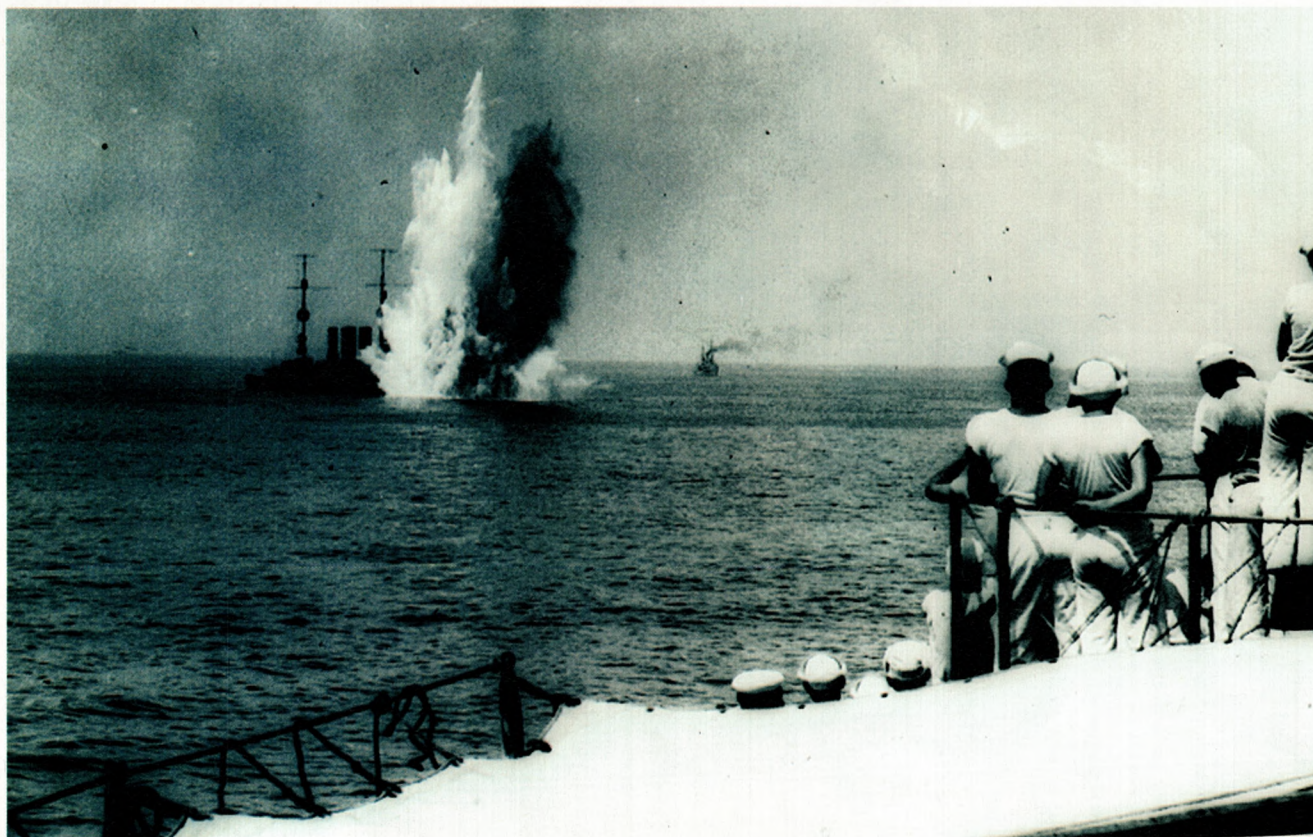
This is the man the world knows and defines as a wreck diver, an explorer of the first magnitude. His name is associated with the premier wreck dives in the United States, the *Andrea Doria*, the *San Diego* and

the *Monitor*, names that are synonymous with adventure and daring. His books, *The Advanced Wreck Diving Guide*, *The Ultimate Wreck Diving Guide* and the newly-released *Primary Wreck Diving Guide* have become the “Bibles” of wreck diving.

But the reality of the man is vastly different from the public percep-

SHIPWRECK FRONTIERS

Along the eastern seaboard of the United States lie a number of relatively unexplored wrecks, many of which lie at, and beyond the boundaries of technical sport diving. For Gentile and others, exploring these shipwreck frontiers safely provides the ultimate underwater challenge. BY BARB LANDER



COURTESY OF BARB LANDER

tion. Reclusive, methodical, a goal-oriented workaholic, Gary is equally at home among the dusty tomes of the National Archives, the Naval Historical Center or the research room of the Mariners' Museum. He describes himself as a writer first and then as an exploration diver.

That Gary is a writer first is easy to believe if you see him at work. His

workday starts at 7:30 a.m. when he climbs the stairs to his book-lined study carrying his second cup of coffee. He switches on his computer, spreads his working notes on his desk, props his legs up and takes the keyboard into his lap.

Long after the sun sets, his brown eyes will still be following the words that spill from his mind onto

the screen. Gary admits that often he has great difficulty putting his writing aside to do other things like food shopping, jogging or diving.

RESEARCH OPPORTUNITIES

It is Gary's writing that directs his diving. Every trip, every dive is a research opportunity. As his recently published books tell where he has

ANDREA DORIA

Easily one of the most spectacular dives on the east coast, the very name *Andrea Doria* evokes magic among wreck divers. She is a luxury liner sunk in 1956; a result of a collision with the *Stockholm*. She lies on her port side in 250 feet of water. Because of her immense size, over 700 feet long with a beam of 90 feet, the top of the wreck reaches to 165 feet. A diver can swim along the Promenade Deck at 180 feet.

Largely intact, the *Doria* offers an exploration challenge to even veteran divers such as Gary. With over 100 dives to the wreck, Gary remains fascinated by her. As internal partitions and bulkheads collapse new areas of the wreck are opened up for exploration. Other parts, such as the upper decks collapse into rubble heaps.

The *Doria* was often described as a floating art gallery filled with paintings, ceramics, statues, fine china, crystal, silver serving pieces, hand-painted vases and other objects d'art. Her treasures are yet being recovered. In 1993, the *Doria* again made headlines when divers recovered two ceramic friezes by Italian artist Guido Gambone.

SAN DIEGO

The *San Diego* is arguably the most dived wreck on the east coast. Lying on her side in 110 feet of

The ex-German light cruiser, *Frankfurt*, was bombed in early tests of U.S. air power.

water, this armored cruiser rises to 70 feet making her a perfect dive for all levels of divers. A veteran of the Spanish-American War, the *San Diego* met her demise off Long Island when she struck a German mine during World War I.

Despite her age, she is another largely intact wreck. It is the maze of corridors and rooms that draw veteran explorers to the site. Gary spent nearly a decade learning the corridors, rooms, decks, and hatches, yet it is here on the *San Diego* that he once thought he was so lost that it was all over. Fighting down the urge to panic, it was his intimate familiarity with the wreck that saved him.

U.S.S. MONITOR

Nicknamed the "cheese-box on a raft" the *Monitor*

THE DORIA OFFERS AN EXPLORATION CHALLENGE TO EVEN VETERAN DIVERS SUCH AS GARY GENTILE.

ushered in a new era of naval warfare. With the launching of the *Monitor* and her Confederate counterpart, the *Virginia*, the era of wooden battleships died. In the 24 hours the *Virginia* rampaged before the arrival of the *Monitor*, she completely destroyed two Union ships and damaged several others. Union blood poured that day with over 240 casualties; the Confederates suffered only eight.



The luxury liner *Andrea Doria* sunk after a collision with another ship.

The following day the *Monitor* arrived to challenge the Confederate ironclad. The clash of iron resounded, not just throughout Hampton Roads, but throughout the world. The battle between the *Monitor* and the *Virginia* ended in a draw, and the two

landed atop the turret. The unsupported 8-foot wide armor belt is sagging downward toward the sand. In the midships area, the outer hull has collapsed revealing the engineering space and living quarters.

The 1993 Hess/Gentile Expedition located and recovered two U.S. Navy Mustard bottles with the contents intact, an unbroken ironstone dinner plate and a pair of brass fairleads. These items were turned over to NOAA for study, restoration and display.

REPUBLIC

The Republic, a luxury liner, sank in 1908. A collision with the liner, *Florida*, sent the ship to the seabed 270 feet below. Of the 465 passengers aboard, there were only four fatalities. The *Republic* has the dubious claim to fame of being the first marine casualty to summon assistance using wireless radio.

The 1980s saw commercial salvage operations on the

been (*Shipwrecks of North Carolina from Hatteras Inlet South*, *Shipwrecks of North Carolina from Hatteras Inlet North*, *Ironclad Legacy: Battles of the U.S.S. Monitor*, and *Shipwrecks of Virginia*), so do his recent trips indicate pending books, the *Republic*, the *Norness*, and the *Pan Pennsylvania*, all sunk off New York.

These wrecks reflect Gary's rep-

utation for adventure and daring. All of the wrecks mentioned thus far, except the *San Diego* lie in more than 200 feet of water. And yet, Gary adamantly denies being a "deep freak." Says Gary, "I just do what I have to do to get to the wrecks I want to see."

Sometimes, however, what he has to do is not so much. One of

Gary's favorite dives is the *Hesperides* in 35 feet of water. His first dive on this wreck lasted more than two hours. He recovered several portholes and came up not because he was low on air, but because he was hungry.

Depth has little meaning in Gary's thinking, for him the *Doria* or the *Monitor* is not a deep wreck. "I

wreck site. Treasure seeker Martin Bayerle searched for the \$3 million in gold rumored to be aboard when the *Republic* went down. Despite Bayerle's failure to find any sign of the treasure, the rumors persist.

Exploration divers made their first assault on the remains of the *Republic* in 1993.

NORNESS

The tanker *Norness*, of Panamanian registry, found its watery grave in April of 1944 courtesy of Kapitänleutnant Reinhard Hardegen and the *U-123*. Sunk only 60 miles off New York, it was the first blow against merchant shipping in American waters.

At nearly 10,000 tons, the sinking of the *Norness* moved Hardegen well along in his quest for the Ritterkreuz (Knights Cross).

In 1993, divers found the *Norness* in two pieces. The stern section lies on its side in 280 feet of water, nearly intact until the midships section disappears abruptly into jagged metal edges and black water. The bow remains unexplored.

PAN PENNSYLVANIA

The *U-550* scored with another of the U-boats favorite prey when it sank the tanker, *Pan Pennsylvania*. The 11,000 ton kill would not earn Kapitänleutnant Klaus Hanert his Ritterkreuz, however, for the *U-550* would follow its prey to bottom. By 1944, the Americans had mobilized their defenses and become lethal submarine

hunters. Three destroyer escorts pounced on the *U-550* and blasted her to smithereens. Hanert and eleven of his crew survived.

Fifty-one crewmen of the *Pan Pennsylvania* were rescued; several crew members were killed not by the torpedo blast, but by panicked and inept attempts to abandon ship.

The *Pan Penn* sank slowly while fire raged in her engine rooms. Ultimately, she turned turtle and her bow stubbornly refused to sink. The *U.S.S. Sagamore* delivered

crews of Hatteras, Creeds Hill and Big Kinnakeet stations. The freighter and her cargo of pig iron were pounded into the sea where they remain today.

Recently located by sport divers, the *Hesperides* provides a unique thrill for exploration divers. Covered by only 35 feet of water, divers have the luxury of time for leisurely exploration. It would be hard to find a more picturesque site to explore. Fish life abounds, and the ravaged hull still contains many identifiable ships parts. The

RECENTLY LOCATED BY SPORT
DIVERS, THE *HESPERIDES*
PROVIDES A UNIQUE THRILL
FOR EXPLORATION DIVERS.

the coup-de-grace and sank the *Pan Penn* with gunfire to eliminate navigational hazards.

Little is known about the *Pan Pennsylvania* as she exists today. A group of exploration divers have tentatively identified her final resting spot in approximately 300 feet of water and plan an expedition to the site in 1994.

HESPERIDES

The treacherous water of the Gulfstream claimed the *Hesperides* as a victim in 1897 when her captain failed to adequately compensate for the current's drift and ran hard aground on the Diamond Shoals. All the crew were successfully rescued by lifesaving

engine rises to within seven feet of the surface; the steering quadrant, a majestic sight only nine feet below the surface. The rudder is sanded into a turning position, and two blades of the propeller protrude from the sand. It is possible to swim through the propellers shaft alley, a distance of about 30 feet. The anchors hang from their mangled hawsers on the bow and grouper peer from the recesses of the boilers.

Mother Nature, with her omnipresent sense of humor did not want to make the dive too easy on explorers. The current and surge on the shoals can be horrendous, but according to Gary, diving on the *Hesperides* is worth the effort.

THE OSTFRIESLAND AND THE BILLY MITCHELL FLEET.

After World War I, when the airplane was in its infancy, it had a vocal proponent in Army General Billy Mitchell. The military brass, including the commander-in-chief, had no faith in airships as weapons. In 1921, after years of struggle, Mitchell won permission to conduct an experiment.

Army planes would drop bombs on German naval vessels that had been awarded to the United States as prizes of war. He wanted to prove that aircraft could sink battleships. The situation was desperate, the few planes that the U.S. possessed were falling apart, and there was no funding for repairs or replacements.

Mitchell's planes proved his theory in 1921 by sending the battleship *Ostfriesland*, the light cruiser *Frankfurt*, a destroyer and a U-boat to the ocean bottom in more than 50 fathoms of water off the Virginia Capes. For purposes of comparison, three other destroyers and two U-boats were sunk as part of the same exercise by naval gunfire. Aerial bombardment was clearly more effective.

Mitchell is proof that being right does not necessarily make you the winner. In 1925 he was court-martialed for his outspoken views on airpower. It was not until the 1940's that the United States created the independent Air Force of Billy Mitchell's dream.

Another dreamer, Ken Clayton, harbored a childhood

have the training and experience," he explains with a shrug.

That training and experience is something he had to fight to get. In the 1970s and early '80s long decompression was frowned on. He was diving with helium and nitrox mixtures before any training programs existed for sport divers. Gary found himself banned from more than one

boat as he pursued his goals with rugged individualism.

WRECK STANDARDS

Many of the techniques Gary developed through trial and error are the standard for deep wreck divers today — passed on not through agency courses, but from diver to diver. One such example is

the "jonline," named after Jon Hulbert who first used a line to ease decompression in heavy sea and current conditions. Gary gets downright testy when he sees the word misspelled — it is one word and there is no "h" in jon. "After all," he says, "I invented the word."

He readily admits that developing technology is opening up

fascination with the *Ostfriesland* and the other vessels of the ex-German fleet. Clayton convinced Gary Gentile that the dive was possible, thus the ultimate deep-wreck exploration team was born.

The dive was planned for 1990, and Clayton willingly assumed the responsibilities of planning the project. Diligent research revealed lat/long coordinates that meshed with known hang

numbers. Arrangements for breathing gases, decompression tables, support divers and a dive vessel had to be made. Nothing of this magnitude had been attempted by "sport divers" in open water before.

With the *Ostfriesland* successfully under their weight belts, the Clayton/Gentile team continued their exploration the following year with a return trip to the battleship and the location and discov-

ery of the light Cruiser *Frankfurt* in 350 feet of water, the *U-140* and the *UB-148*, both in 270 foot depths.

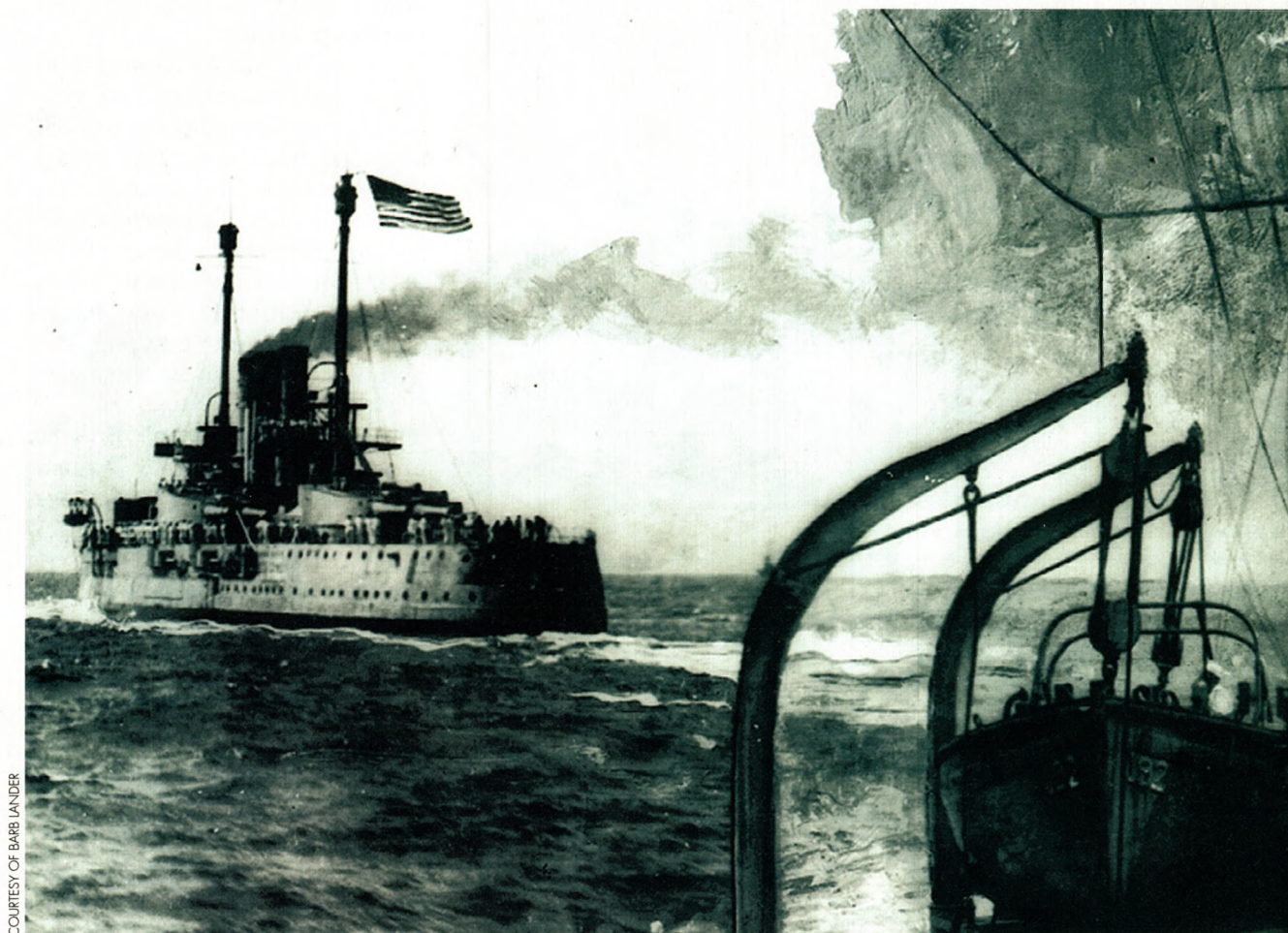
Clayton remains committed to the project, hoping to locate the destroyers sunk in Mitchell's experiment.

HAMILTON AND SCOURGE

The *Hamilton* and *Scourge* were part of the U.S. Naval fleet in the Great Lakes

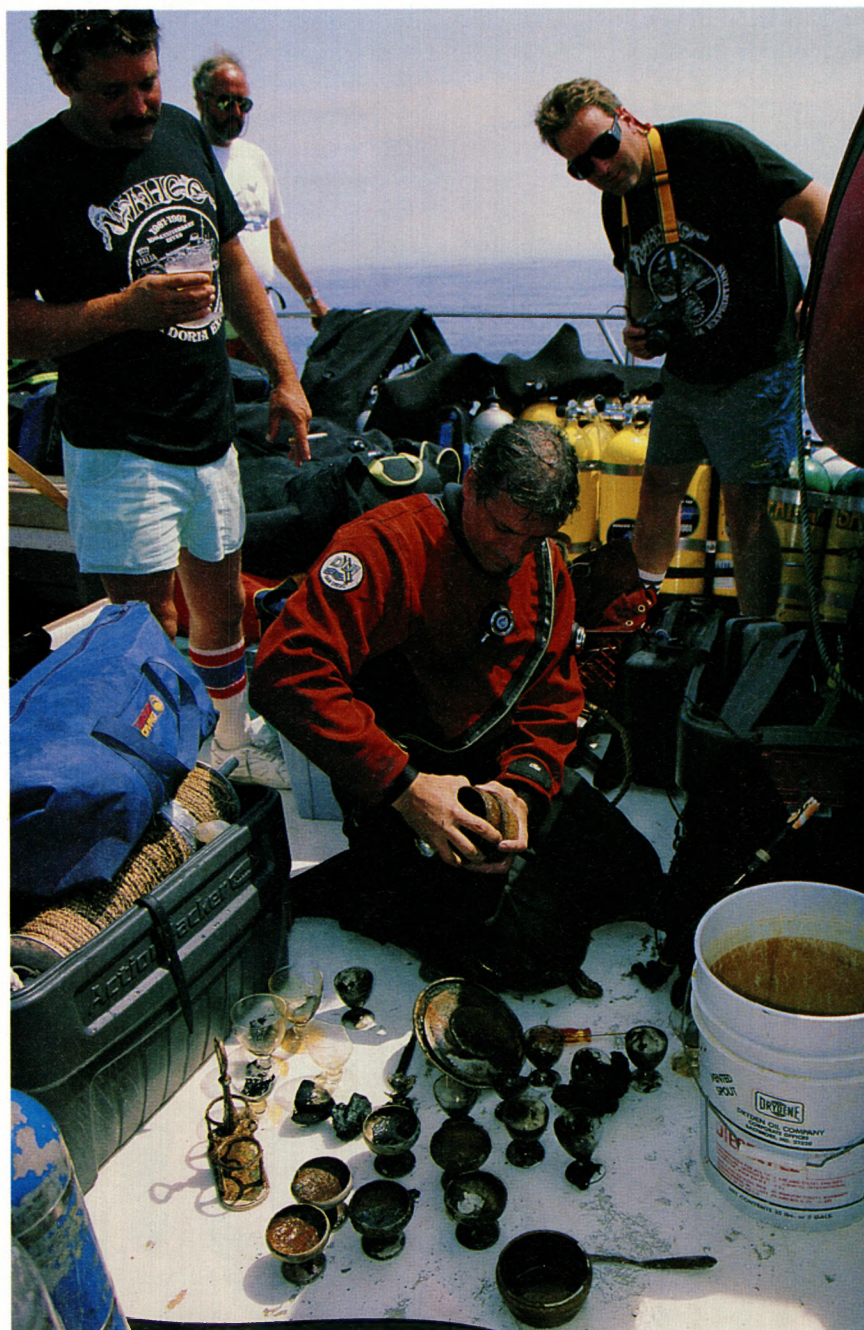
in the War of 1812. The ships were deprived of the opportunity for a gallant death when they were swept beneath the wild waters of Lake Ontario during a sudden squall.

Sunk in Canadian territorial waters, the U.S. government ceded the ships remains to the Canadian authorities. Resting not far apart, 300 feet below the surface, the wrecks lie undisturbed and unexplored. ■



COURTESY OF BARB LANDER

The ex-German battleship *Ostfriesland* was an American prize of war.



Gary Gentile surrounded by recovered "treasures."

wrecks that a decade ago he believed to be undiveable.

Take the *Ostfriesland*, for example. When his preliminary research in the '70s showed it to be sunk in 380 feet of water, Gary filed the information and his dreams of diving it away. In 1990, Gary, together with Ken Clayton, breathing a heliox mixture, using stage bottles, support divers, custom-generated decompression tables and surface-supplied oxygen for the 10- and 20-foot decompression stops, descended to

the *Ostfriesland*; a benchmark in open water exploration.

PERMISSION GRANTED

But technology is not the only obstacle to diving deep wrecks. Gary's quest to dive the *U.S.S. Monitor* was frustrated for the better part of a decade by NOAA, the governmental guardian of the historic site. Gary wrote hundreds of pages of letters and permit applications and ultimately spent thousands of dollars of personal funds to pursue the issue

in court; his only ally in the long battle, attorney Peter Hess.

Gary saw himself as spokesperson for wreck divers at large, vocalizing what he believed to be their desire for open access to wreck sites. The pain is still evident in his eyes and his voice when he recalls that a 1988 plea to divers to write NOAA resulted in not one letter.

Gary and Peter's solo battle won them a court ordered permit to dive the *Monitor* in 1990. Their victory dissolved into defeat, however, when their permit application was denied for 1991.

The following year another denial drew congressional attention. With an irate congress breathing down NOAA's neck, the permit was issued forthwith. Since that time, the manager of the *Monitor* National Marine Sanctuary has changed and a spirit of respect and cooperation is developing. The permit application process for a 1994 expedition is proceeding smoothly.

Confident that the *Monitor* problem is under control, Gary and Peter have turned their sights to a new battleground. They would like to dive the *Hamilton* and *Scourge*. The wrecks are under Canadian jurisdiction, and negotiating the red tape to secure permission to dive the wreck is reminiscent of the early *Monitor* days. Hess reports, however, that negotiations seem to be going well. Stay tuned.

With dozens of such projects pending Gary is not even contemplating retirement from exploration diving. Technology is opening up new frontiers every day. He sees explorers taking advantage of technology to move further offshore and into deeper water to get to those untouched wrecks. There may be a day, he concedes, that he will explore a wreck site in a one atmosphere suit or a mini-sub. Look out twenty-first century, look out *Titanic*, Gary Gentile has learned to never say never. ■

Experienced wreck diver and author Barb Lander is a long-time friend and dive buddy of Gary Gentile.

Your Favorite Key West Diving Spot.



Park your car, dock your boat and stow your gear at your favorite Key West diving spot: Pelican Landing Resort & Marina and the adjoining Subtropic Dive Center. What could be more convenient than having the island's friendliest dive shop right next door to your luxury hotel.

Subtropic offers a complete line of diving equipment and accessories, for sale or rent. A big 24,000 cubic foot air storage tank, so there's no waiting for air fills. Certification classes to up-grade your skills. There are even beginner and one-day resort courses.

Put a little spice in your diving with specialty trips just for underwater hunting, photography, night diving and wreck dives aboard the 12 diver *Pelican* or the 18 diver *Island Diver*. Leaving from the dock, just steps from your accommodations at Pelican Landing Resort & Marina.

Relax after diving in a 1, 2 or 3 bedroom Suite, Penthouse or hotel room. Complete kitchens. Daily maid service. Balconies overlooking the water. Marina with dockage for up to a 50 footer. Protected harbor. Knowledgeable diving and fishing guides.

Special 2 night, 3 day dive packages start at just \$82.50 (per person, per night, double occupancy in a luxury guest room with HBO) and includes two dives (each is a two-tank dive and tanks, air and weight belts are supplied). Call us for reservations or a color brochure:

1-800-527-8108

Subtropic Dive Center

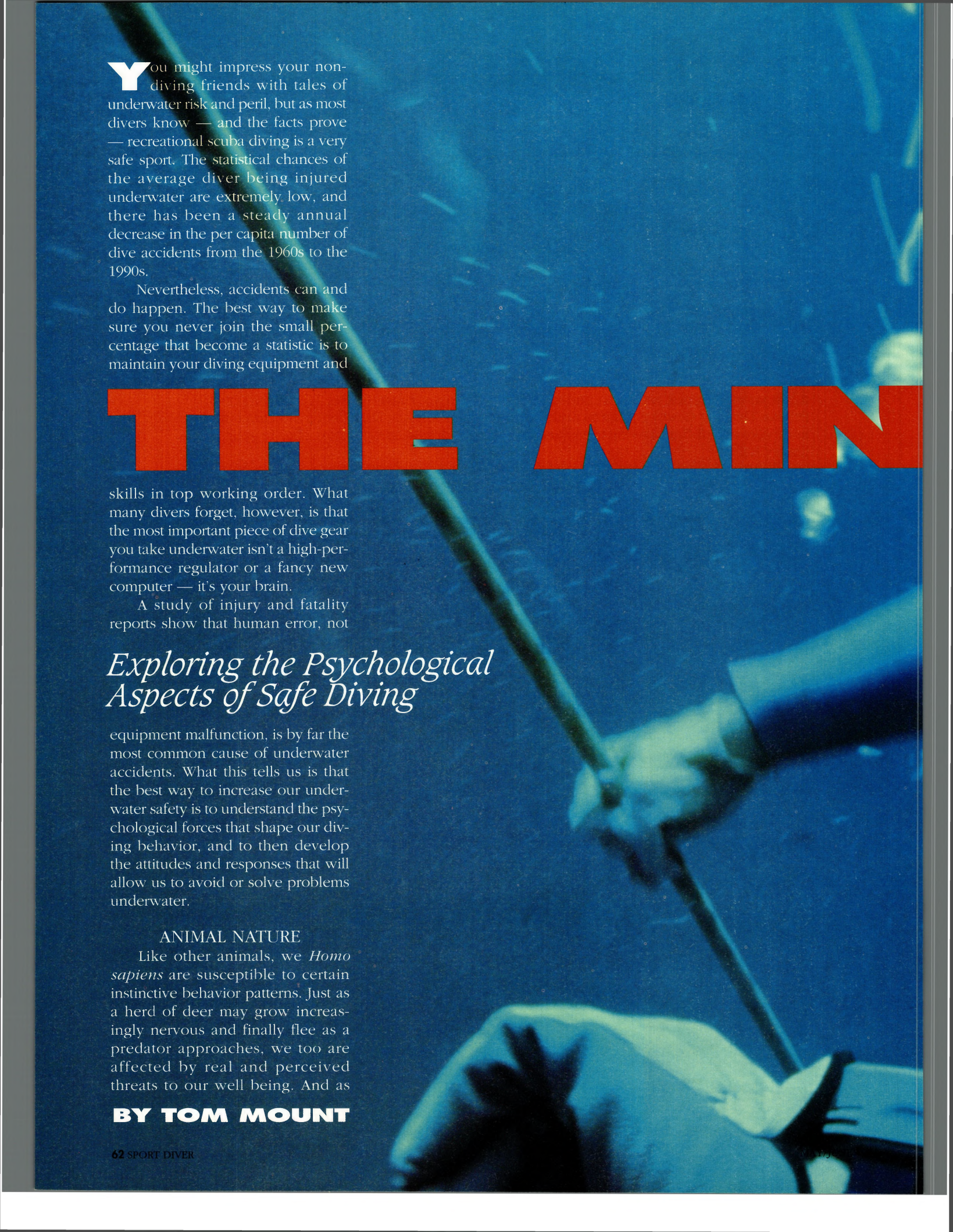
1605 N. Roosevelt Blvd., Key West, FL 33040
1-800-853-3483

PELICAN LANDING Resort & Marina

915 Eisenhower Drive, Key West, Florida 33040 • Access # AEYWPL
Managed By Richfield Hotel Management, Inc.

Product Information 6





You might impress your non-diving friends with tales of underwater risk and peril, but as most divers know — and the facts prove — recreational scuba diving is a very safe sport. The statistical chances of the average diver being injured underwater are extremely low, and there has been a steady annual decrease in the per capita number of dive accidents from the 1960s to the 1990s.

Nevertheless, accidents can and do happen. The best way to make sure you never join the small percentage that become a statistic is to maintain your diving equipment and

THE MIN

skills in top working order. What many divers forget, however, is that the most important piece of dive gear you take underwater isn't a high-performance regulator or a fancy new computer — it's your brain.

A study of injury and fatality reports show that human error, not

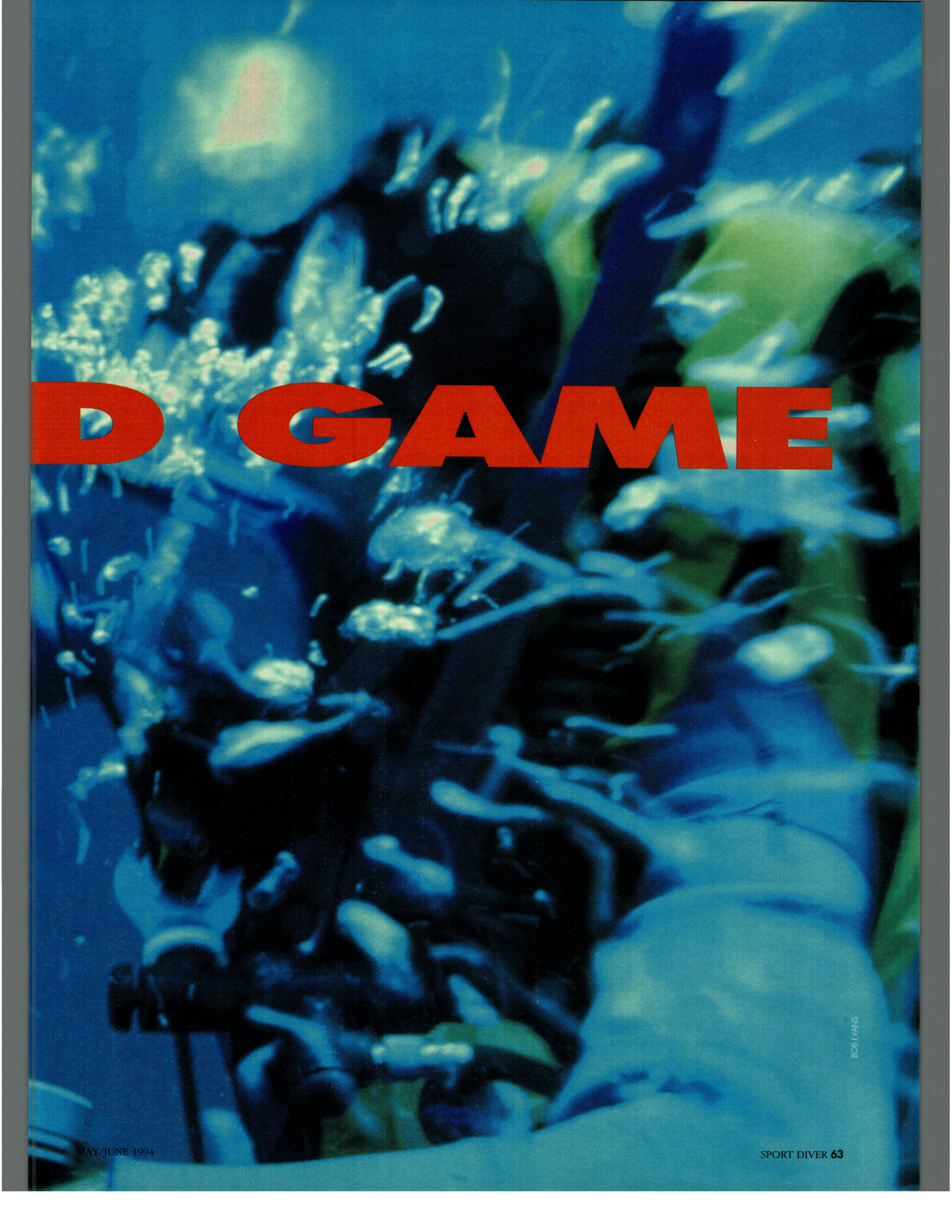
Exploring the Psychological Aspects of Safe Diving

equipment malfunction, is by far the most common cause of underwater accidents. What this tells us is that the best way to increase our underwater safety is to understand the psychological forces that shape our diving behavior, and to then develop the attitudes and responses that will allow us to avoid or solve problems underwater.

ANIMAL NATURE

Like other animals, we *Homo sapiens* are susceptible to certain instinctive behavior patterns. Just as a herd of deer may grow increasingly nervous and finally flee as a predator approaches, we too are affected by real and perceived threats to our well being. And as

BY TOM MOUNT

A vibrant underwater photograph featuring a diver in the upper left, surrounded by a massive school of small, silvery fish. The scene is set against a backdrop of blue water and green seaweed. The title 'D GAME' is overlaid in large, bold, red letters.

D GAME

BOB EVANS

anxiety builds, we too may reach a point where panic — the inherent “fight or flight” response — overcomes our rational thought process.

But even before full-fledged panic reactions take over, stress may cause changes in our behavior patterns. As stress levels build, the body actually changes physiologically. Pulse and breathing rates go up, movements may become uncoordinated and perceptual narrowing takes hold.

What sets us apart from other animals is our ability to recognize and reverse these changes. Many of the stress reactions we are subject to are based not on actual physical threats such as a stalking lion, but are instead products of our minds.

For example, a new diver who

caused by the nature of the scuba system. The “meter” is always running as a diver uses up the available breathing gas supply from the tank.

This can become a major stressor when a dive plan has been exceeded and the gas supply is running low. In this situation, anxiety may cause the undisciplined diver to actually increase their breathing rate, thus compounding the problem.

Time pressure stress can also become a problem with regards to decompression. As divers reach the edge of no-stop limits or require staged decompression, anxiety may overcome training. The result may be a rapid ascent to “stay out” of decompression, rather than a slow, controlled ascent that allows for safer offgassing.

while the diver causing the delay may experience frustration.

Task Loading—Any time divers attempt to perform more tasks that they feel comfortable doing, task loading becomes a stressor.

This could begin as early as a checkout dive when a student attempts to maintain buoyancy control while equalizing. The task of manipulating the unfamiliar BC inflator button while simultaneously clearing the ears and maintaining contact with the descent line can be overwhelming at this stage of the diver's development.

The same scenario will repeat itself as the diver gains experience and assumes increasingly more complex underwater activities. The addition of a camera and strobe will ini-

THE MOST IMPORTANT PIECE OF DIVE GEAR

becomes separated from the dive-master might panic from the fear of being lost or “left behind,” even though there is actually no physical danger or discomfort at that time.

We may not be able to control all aspects of a dive, but we can learn to recognize and overcome our response to stress, and that can make the difference between an enjoyable underwater experience and an accident. The key to controlling stress lies in creating an awareness of its causes and symptoms, and in developing the mental discipline required to maintain an attitude of positive competency.

In the following sections, we will explore some causes and symptoms of diver stress, and then look at some of the methods used to control and overcome the problem.

STRESS IN DIVING

Many divers consider their time underwater to be a form of stress relief. It's ironic that some elements of the dive experience can become stress producing. Let's consider for a moment some of the major stressors a diver may be exposed to:

Time Pressure Stress—The simplest form of time pressure stress is

Another subtle form of time pressure stress occurs while preparing for a dive. For example, one diver suits up and enters the water while the buddy has an equipment problem and has to remove gear to make repairs. The diver waiting in the water may become stressed,

tially add new stressors, for example, as the diver now has both hands occupied.

Incorrect Breathing Patterns — Most serious stress-related incidents either result from or lead to abnormal breathing patterns. This can become a vicious cycle. Abnormal breathing



Task loading stress can occur as early as check-out dives, due to unfamiliarity with equipment and will also affect advanced divers when additional equipment is added.

produces stress that a diver may not even recognize, and the problem is compounded as the body's physiological reaction to stress is a further increase in breathing rate.

Under stress, a diver may hyperventilate or fall into a pattern of rapid, shallow breathing. As a diver continues to breathe in without fully exhaling, the lungs become full and the diver is unable to inhale. This can lead to the erroneous assumption that the regulator isn't working, which may in turn trigger a full-fledged panic reaction.

At the other end of the spectrum, hypercapnia can occur when a diver attempts to perform extreme forms of skip breathing. This excess CO₂ buildup may lead to unconsciousness.

stress recognition and diver control in panic situations.

There are a number of behavioral clues to heightened stress levels both in ourselves and our dive partners. On the surface, the diver who seems unusually quiet, "fidgety," or uncharacteristically boisterous is often harboring anxieties.

Underwater, increased respiration is the most common sign of increased stress. Other symptoms include fixation on gauges, freezing up, changes in the swim pace, clumsiness, a failure to communicate or a "big eyed look." Skills that were poorly or recently learned may be forgotten, and mental narrowing often prevents a diver from recognizing his own changed behaviors.

any such problems and "just get wet." But often, taking a few extra minutes on the surface to sort things out can make a tremendous difference in your underwater performance.

One of the best ways to lower stress levels and contribute to a good dive is through pre-dive meditation and visualization. As you prepare for the dive, take a couple of minutes to stop, relax and take a series of deep, slow breaths. Breathe deeply by expanding the diaphragm as you inhale to pull fresh air all the way to the bottom of your lungs.

As you practice relaxation breathing, begin to visualize your dive. Create a mental image of a safe, relaxed dive, and search your mind for any negative emotions or anxieties that may hinder performance.

YOU TAKE UNDERWATER IS YOUR BRAIN

Other Stressors—These include some obvious and some very subtle sources of stress. The physical threat of an attacking shark is a very real source of stress, but the viewing of a relatively harmless shark during a feeding dive need not cause the same reaction — if we can condition ourselves to realize that the actual threat in this situation is minimal.

Dependency or "Trust Me" diving takes place when a diver is persuaded by a buddy to engage in unfamiliar and more difficult forms of diving. In such cases, the less experienced diver may be operating beyond the personal comfort level.

Physical discomfort, disorientation, buoyancy problems and a host of other physical and mental factors may add an additional stress load. And, as most instructors and lifeguards can attest, the effects of these stressors seem to multiply rather than add as a diver moves from a relaxed state toward full panic.

RECOGNITION AND REACTION

Recognition is the first step in controlling stress. All divers should be encouraged to enroll in a dive rescue class and participate in other types of training that emphasizes

Self rescue is still possible at this point if you remember to simply cease all activity, exhale slowly and fully and then inhale slowly. Continue to breathe slowly and exhale fully while remaining at rest until you feel relaxed and in control.

If a dive partner exhibits similar signs of stress, halt the dive and use hand signals, pantomime or use a slate to encourage them to perform relaxation breathing. Grabbing or forcefully restraining a stressed diver may worsen the situation, and might lead to a full panic reaction that could endanger both divers. As previously mentioned, divers should seek training in dive rescue techniques to prepare for such situations.

STRESS RELIEF

There are additional skills that a diver can learn and practice to enhance the awareness of and reaction to underwater stressors.

Awareness is the first step to a solution. It is developed through a process of self and group analysis. Pause before making the plunge and study your own behavior.

Are you tired, hot, uncertain about the dive? Do your dive buddies seem to exhibit any similar discomforts? Our egos tend to have us ignore

This will allow you to start the dive in a safe, aware mental state.

You should strive for the same levels of calm and awareness throughout the dive. This will allow you to detect changes in your buddy's or your own dive performance that might otherwise go unnoticed. Ongoing training and the over-learning of important skills will add to your diving safety and enjoyment. A certification course should be seen as just a starting point in an ongoing skills-development program.

Learned skills such as buddy breathing, diver assists and emergency ascents should be practiced repeatedly until they become virtually automatic responses.

Develop an awareness of your breathing patterns and dive behavior, and constantly look for ways to improve performance and increase your underwater efficiency.

Evaluate and configure your equipment to ensure ease of use and maximum accessibility and dependability.

As your interests expand, seek additional training in advanced and specialty areas of diving. Select dive buddies who share your commitment to maintaining and developing their diving skills.

Survival instinct development is an area of training that is overlooked by most divers and instructors. But experience has shown that static skills learned in non-stressing classroom or pool environment do not necessarily teach one to survive a real situation in open water.

For example, a diver taught to share air in a pool by simply taking the buddy's alternate second stage and swimming leisurely for a short distance may not be prepared for a real out-of-air situation. On a dive in 60 feet of water, this diver might experience an air failure and find his buddy is 15 feet away and swimming the opposite direction.

Will this diver have the discipline to swim the 15 feet plus the additional distance the buddy has travelled and then initiate successful air sharing? While most divers are physiologically capable, many will not be able to because their minds have not been trained to react in a controlled, positive manner when faced with a real-world emergency.

At some point during the training process, divers should be encouraged to engage in survival skills development. One such exercise we use is to have students take a breath at the surface of the pool, swim 50 feet (further in advanced training programs), and then commence air sharing.

By performing this task, students are exposed to the psychological and physical stress of really needing air, and of overcoming this stressor to successfully complete the exercise. The mind stores such accomplishments, and in the event of a real-world out-of-air situation, the survival-trained diver is much more likely to react properly and maintain control while swimming for air.

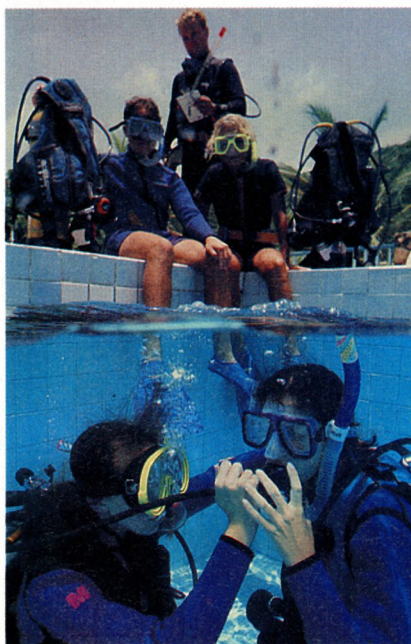
We take this exercise one step further by having students perform a timed swim while sharing air. The times are based on a normal swim pace, which means that if one or both divers change their swim pace, it will affect the duration of the team's air supply.

Speeding up the swim will result

in increased air consumption and additional stress. Slowing, on the other hand, may decrease air consumption, but it will significantly increase the duration of air sharing, and may not allow for sufficient air supply to surface safely.

With practice, students learn to swim and share air at a controlled, normal pace while maintaining a normal respiration rate.

Additional survival training involves exercises that intensify one's ability to focus the mind and to function effectively outside of the personal comfort level.



Emergency skills such as buddy breathing should be practiced until they are second nature.

ing exercise is to look at the second hand of a clock, concentrating on the movement of the hand while not allowing another thought to enter the mind. This should be practiced until total concentration can be maintained for two minutes.

Why is this important? Because during threatening situations, all types of negative thoughts and emotions enter the mind. By increasing our ability to focus, negative thoughts can be locked out and we can concentrate on the positive and take steps to solve the problem.

Another class of exercises that

build not only concentration, but also combine mental and physical discipline are those that force us to function beyond our comfort level. Examples include swimming, running, cycling or any other number of exercise programs that give you the chance to push yourself.

For example, the author uses a Stairmaster exercise machine for a very specific type of mental/physical training. The exercise begins by establishing a sustainable pace and work load on the machine. After the cardiovascular system adjusts and a breathing pattern is established, the author then bumps up the tempo and work load for a specific interval while attempting to maintain the same breathing rate.

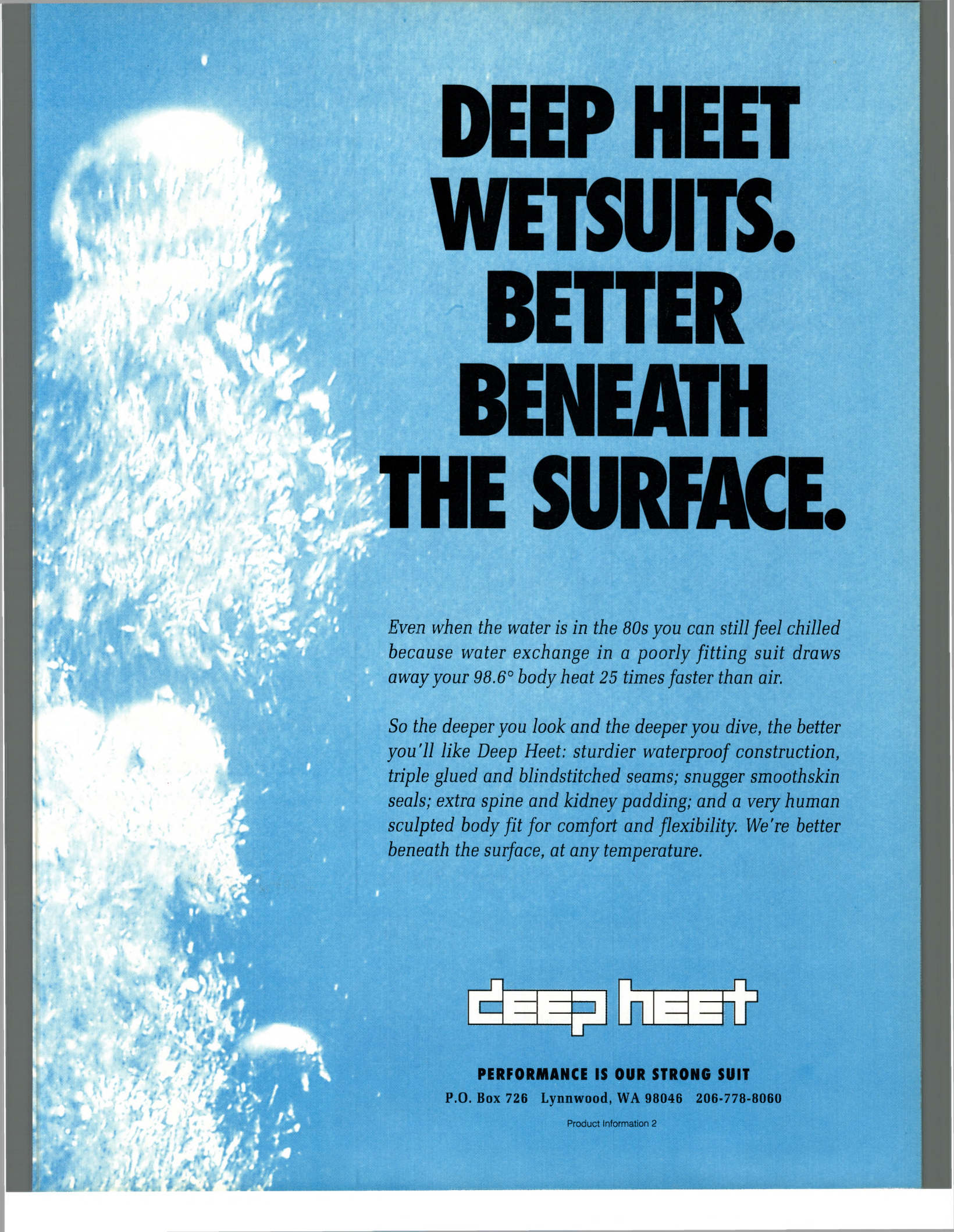
The purpose is to train the mind to hold the body in check, overriding the instinctive tendency to breathe faster or work less. If one is able to complete such an exercise, even though the mind is screaming to quit, the reward is the development of stronger survival willpower.

PERSONAL COMMITMENT

We all have our bad days, but by practicing skills and exercises such as the ones mentioned in this article, we can learn to overcome many of the physical and psychological stressors that make our diving less enjoyable or less safe.

Responsible divers realize that underwater safety and survival is a personal responsibility. A buddy can provide assistance, but your welfare is ultimately in your own hands. By developing and maintaining underwater awareness, survival skills and a focused, positive mental attitude, you will not only become a non-dependent diver, you will also enhance your underwater attitude and spend more time enjoying the diving experience. 

In his 30+ year career, Tom Mount has participated in and presided over virtually every type of dive training program from open water to extremely advanced forms of technical diving. He currently serves as president of IANTD.



DEEP HEET WETSUITS. BETTER BENEATH THE SURFACE.

Even when the water is in the 80s you can still feel chilled because water exchange in a poorly fitting suit draws away your 98.6° body heat 25 times faster than air.

So the deeper you look and the deeper you dive, the better you'll like Deep Heet: sturdier waterproof construction, triple glued and blindstitched seams; snugger smoothskin seals; extra spine and kidney padding; and a very human sculpted body fit for comfort and flexibility. We're better beneath the surface, at any temperature.

deep heet

PERFORMANCE IS OUR STRONG SUIT

P.O. Box 726 Lynnwood, WA 98046 206-778-8060

Product Information 2

The Red Sea. Most North American divers have heard tales of its splendor, but historically only a lucky few have made the pilgrimage to

this Mid-East dive mecca. In recent years, however, tour operators are offer-

“Along with masks, fins and Nikonoses, a diver visiting the Red Sea needs to bring some tolerance and an open mind...”

— Eric Hanauer

ing increasingly affordable and convenient

excursions from the United States and Cana-

da, allowing Americans to share the splendors of what has long been a

favorite of European divers.

Well Red

To capture the Red Sea experience, we asked two correspondents to share their separate impressions. One, a veteran of hundreds of Red Sea dives,

draws on his years of experience gained from traveling to and living in areas of the Middle East surrounding the Red Sea.

The other, a travel writer and avid diver, shares

“Every turn of the head, every slight change of depth produces a new and stunning visual array. Ras Za’atir is a fantasy beneath the sea.”

— Valerie Moore

an account of a sometimes less-than-perfect first encounter that demonstrated not only some of the pitfalls that can confront the adventurous traveler, but also the rewards that await.







"Where camels once roamed desert sands, there are now swimming pools and Hiltons with continental chefs."

The Middle East. Arabs. Israel. Muslims. What are the first images that come to your mind? If you haven't been there, it's probably camels, terrorists, Uzis and scud missiles.

But for divers who have done their homework and taken the time to get to know the area, the predominant impressions are history,

Sea are the third most heavily dived in the world, behind only the Caribbean and the Maldives. But this isn't the Caymans, geared primarily to serve American tourists. The Red Sea is a European playground.

In the twelve years since the Sinai was returned to Egypt as a result of the Begin-Sadat-Carter

with continental chefs. The camels still make occasional appearances, but they belong to local Bedouins trying to get a piece of the action by hawking rides to tourists.

With some 800 miles of coastline on the Red Sea, most of the diving there is done in Egyptian waters, even if you go on an Israeli boat. (Israel has less than ten miles of coastline.) Many Egyptian operations are run by and for Germans or Italians, who know how to keep the boats running on time. One guide described his dive center this way: "This isn't Egypt, this is Germany."

But it's still a long way from Stuttgart. Egypt is a third world country, maintaining an infrastructure that serves thousands of tourists at the edge of one of the harshest deserts on earth. Modern miracles that we take for granted — phones, faxes, electricity and fresh water — can fail in even the most prosperous countries.

WORDS FOR THE WISE

It's easy for tourists to become frustrated or angry when things go wrong, but it's hard to stay mad very long. Egyptians have developed the capacity to cope with the harsh realities of life, maintaining a happy, hospitable nature in the face of hardships that can turn others dejected and mean spirited. Their attitudes and philosophy can be summed up by three Arabic words: Inshallah, Bokhra, and Malesh. Visitors would be well served to learn their meaning.

Inshallah means "Allah willing." All commitments and appointments are made with this proviso, as: "The dive boat leaves at 9 a.m., inshallah." If the boat didn't make it on time because of mechanical problems or because the skipper overslept, Allah must not have wanted it to.

Bokhra means tomorrow. If we couldn't dive Ras Muhammed

A Red Sea Traveler's Survival Guide

BY ERIC HANAUER



A ship of the desert, now pressed into charter service for tourists.

hospitality, chutzpah and the dazzling waters of the Red Sea.

This complex, turbulent area is home to some of the best diving on the planet. The waters of the Red

peace treaty, the diving centers of Hurghada and Sharm el Sheikh have come a long way. Where camels once roamed desert sands, there are now swimming pools and Hiltons

because of unfavorable winds, we will make it tomorrow, or the day after, or the day after that.

Maresh means, "it doesn't matter." We are diving Elphinstone Reef today instead of The Brothers, but we are alive and healthy and underwater, so in the grand scheme of things, maresh.

ATTITUDE ADJUSTMENT

Along with masks, fins and Nikonoses, a diver visiting the Red Sea needs to bring some tolerance and an open mind, leaving stereotypes and prejudices at home. It's their country and you are a guest. You will be exposed to a different way of life which includes a few elements that conflict with American values (diet, smoking, the status of women).

Women visitors may be uncomfortable with the macho attitude sometimes displayed by men. The Arabic word for it was adopted by George Lucas for his Star Wars movies: "Jeddi." But as in Mexico, Italy and even America, it's mostly swagger and talk.

Women wearing shorts and tank tops in the city or acting too assertively attract more remarks because they are so contrary to the accepted standards of society. Religious Islamic women are expected to keep their hair, arms and legs covered, but western dress is more prevalent among the upper classes. For tourists in the cities, a skirt and a top with short sleeves is recommended. At beach resorts, practically anything goes.

MILITANT POSTURING

In American movies, novels and television shows, Arabs have become synonymous with terrorists. They are the media Nazis of the nineties, and many American tourists are prepared to treat them with fear and loathing.

On arrival at the airport, overly officious customs inspectors and uniformed soldiers with rifles reinforce the stereotype. The intimidated visitor is reluctant to leave the sanctuary of the Hilton or the live-

aboard boat. That would be a major mistake.

Let's look at some facts. War has been a constant fact of life in the Middle East for centuries. Soldiers aren't hidden away in military reservations; they are out there with the people and they carry guns. The streets of Tel Aviv or Cairo or Akaba may seem like old-time Dodge City, but the guns are more for show than go.

One time we were coming out of the water in full scuba gear after a beach dive off Sinai. An Egyptian soldier confronted us, rifle at port arms, uttering one of the few English words he knew: "Passport!" When we laughed and pointed at our wet suits, he retreated, embarrassed.

Even when doing night research dives in Eilat, we had to check in and out each time with the Israeli Navy. It's been nearly 200 years since an enemy army set foot in the continental United States, so we have trouble empathizing with what seems to be pervasive paranoia.

STREET SAFETY

Egypt is essentially a safe country with friendly people. A rare tourist shooting in Cairo makes news headlines while nightly gangland slayings in the streets of Detroit or Miami are relegated to the back pages.

It's true that a small band of fundamentalists has targeted foreigners in an attempt to discourage tourism, a major source of income for Egypt's beleaguered economy. But they represent the radical fringe, detested and feared by the majority of the country's people. Violent crime is an anathema to true Muslims. I feel safer walking the streets of Cairo than those of downtown Los Angeles.

CULTURAL DIVERSITY

The Middle East is not a monolithic area. There are democracies and dictatorships, countries that love Americans and countries that hate us. Egypt, the recipient of more U.S. foreign aid than any country besides Israel, is our staunchest ally in the Muslim world.

Red Sea Tourist Essentials

PORTS OF ENTRY: Tel Aviv, Israel or Cairo, Egypt.

DOCUMENTS REQUIRED: Israel: Passport. Egypt: Passport and visa (obtainable at port of entry).

Note: If you are planning to visit any other Arabic country besides Egypt, ask Israeli immigration not to stamp your passport.

LANGUAGES: Israel: Hebrew. Egypt: Arabic. English is widely spoken in both countries.

BUSINESS WEEK: Egypt's sabbath is Friday, Israel's is Saturday. Sunday through Thursday is the work week in both countries. Businesses catering to tourists are open seven days a week.

CURRENCY: Israeli shekel equals 40 cents US. Egyptian pound equals 36 cents US (as of February 1, 1994).

ELECTRICITY: 220 volts, 50 cycles, European plugs. Converters are necessary.

PORTS OF EMBARKATION FOR DIVERS: Eilat, Israel. Hurghada and Sharm el Sheikh, Egypt.

CLIMATE: Summer: (June-September) Hot and arid. Air temperatures 100+ degrees F. Winter: (November-March) 60 to 70 degrees F, windy. Rainfall is rare.

Summer water temperatures: 80 degrees F (skins or 1/8" suit), winter 68-70 degrees F (1/4" farmer john suit).

HIGH SEASON: October-April for European tourists. Best diving conditions are in summer.

TOPSIDE SIGHTSEEING: Israel: Jerusalem, Haifa, Jericho, Dead Sea, Galilee. Egypt: Cairo, Luxor, Aswan, St. Catherine, Alexandria.



"Among the disturbing images are grinding poverty, constant wheeling and dealing, and promises that don't come true."

They like us because of our dollars, but also because of our movies, our music and our culture. They are among the most generous and hospitable people on earth.

I'm not saying it's all sweetness

and light. Among the disturbing images are grinding poverty, constant wheeling and dealing, and promises that don't come true. Despite the peace treaty, there is no love lost between Egyptians and Israelis.

Each bad-mouths the other at the slightest provocation. With friends on both sides of the border, this is especially painful to me because both peoples are similar in culture, behavior and even dietary

Hot Red Dive Sites

BY ERIC HANAUER

After some 400 dives spread out over ten years, covering the territory from Eilat to Zabarghad, I am often asked to list my favorites. Amid such a plethora of wonders lots of good ones have to be left out, but the five listed below will captivate even the most sophisticated world traveler.



The Red Sea teems with colorful corals and marine life in stark contrast to the desert above.

RAS MUHAMMED

Ras Muhammed is on most lists of the top sites of the world, so it has to head this one. It is an extensive area at the tip of the Sinai peninsula, encompassing several dive sites: Shark Observatory Wall, Jolanda Reef, Anemone City, and The Quay.

But when people refer to Ras Muhammed they usually mean Shark Reef, a small, circular offshore pinnacle. On the eastern side, a vertical wall drops off into the

indigo blue of infinity.

There are lots of great wall dives in the Red Sea, but what makes this one different is the hordes of schooling fish cruising the water column. Divers leaving the wall and heading into blue water may be surrounded by thousands of jacks, snappers, batfish, tuna or barracuda.

Cruising beneath the schools may be hammerheads, silvertips or gray reef sharks. Turtles, Napoleon wrasse and schools of parrotfish hover along the ledges and crevices of the wall itself.

You will finish with a safety stop at the shallow anchorage, which, despite being beat up from the fins of thousands of previous divers, is still a fish-watcher's delight. Everything from titan triggers to crocodile fish and morays to stonefish hang out there.

THE BROTHERS

Two tiny islands rising from some 6,000 feet of water, miles from anywhere, The Brothers can be reached only during the calm months of summer and early fall. A lighthouse built by the British in the 1880s is the only structure on these forbidding rocks. Underwater, luxuriant colonies of soft corals, Anthias (fairly basslets) flitting about like butterflies and the wealth of colorful reef fish vie for a diver's attention along with the occasional visiting pelagics which can range from tuna to manta rays.

These factors alone make The Brothers something special. But two shipwrecks on the northern end provide the piece de resistance. Bits and pieces of wreckage are scattered along the reef from the surface to 30 feet.

Below that, a track of devastation leads to the ships lying at a precarious angle on the sheer wall. The *Aida*, a passenger ship that has been down about 50 years, rests with the sheared-off bow at 90 feet and the stern at over 200 feet.

Because of the depth and remoteness, essentials like ventilator horns and portholes are still intact. The spectacular view of the wreck from 170 feet, looming overhead like a giant skyscraper with the surface shim-

laws. It's like trying to be the peacemaker in a battle between brothers.

MORE THAN A DIVE TRIP

Diving in the Red Sea is wonderful, but that alone isn't what entices us to go back time after time. It's the warmth of the people, it's the starkly beautiful desert scenery, it's 5,000 years of history set in a living

museum that you can touch and feel.

So don't think of the Red Sea as just another dive trip. It is a journey into a different history and culture every bit as intriguing as the magnificent marine life. Be open to the sights, sounds, and tastes of a different world.

Also be open to the personalities and traditions and legends of an exotic area. Look beyond your hotel

and guided tour, meet the people, accept them for what they are. Your rewards will be every bit as significant as those you discovered beneath the shimmering blue surface of the Red Sea. 

California based author Eric Hanauer has travelled world-wide and spent a considerable amount of time around the Red Sea.

mering in the background, remains etched in memory.

THOMAS REEF

Thomas Reef is the smallest of the Straits of Tiran, but arguably the most exciting. When conditions are right, divers are treated to wild current rides along the sheer walls, which are decorated with brightly colored soft corals and huge sea fans.

A knowledgeable skipper will drop the divers at a point where the current is behind them about 2/3 of the way around, then will pick them up when the drift is finished. Anything is likely to swim by from turtles to tuna, while sharks patrol the area below.

Along the eastern side of the reef, a slit of a canyon runs along a wide shelf, beginning at 140 feet and bottoming out deeper than I care to go. It is so narrow that a diver can touch both walls at the same time. Occasional coral overhangs lend a touch of fantasy.

This is a dive for intermediates and up, but only experienced divers who know where to look and have lots of air remaining should attempt the canyon.

JACKSON REEF

The northernmost of the four reefs that make up the Straits of Tiran, Jackson Reef is one of the region's most heavily dived sites, yet shows little wear from the impact. A wrecked freighter sits atop the reef, but two decades of pounding by the relentless sea have battered it into a rusty skeleton. Dives usually begin on the protected south-



A mantle covers the smooth shell of this cowrie, which is much valued by shell collectors.

ern end, a sloping wall decorated with huge soft coral colonies in reds, yellows, purples and whites. Semi-tame Napoleon wrasse are frequent visitors. No fish feeding is allowed any more in Sinai, but memories of free meals in the past must keep these behemoths coming back.

At about 80 feet on the western side of the reef is a rope. When the current is strong, divers can hold on to it and watch the sharks go by. Less experienced divers can remain along the protected southern wall and observe the reef fish including stonefish, blacktip groupers, rabbitfish, surgeons and the ubiquitous Anthias schools.

PANORAMA REEF

Rising up from deep water just south of Safaga, Panorama Reef is a microcosm of everything that makes the Red Sea a great place to dive. The northern end is a sheer wall, and fish are everywhere.

We have encountered large groupers being cleaned, emperor angelfish, crocodile fish, octopus, and the occasional roving shark. The Anthias are as thick as anywhere I've seen. One of the most difficult things in wide angle pictures is to get a lot of fish between you and your model, because they become spooked by the disturbance and the bubbles. Here, you almost have to bat the fish away.

In contrast, the southern end has a more sloping contour. This was once a vast area carpeted with anemones and their symbiotic clownfishes. Unfortunately, they have been thinned out dramatically, probably from the pressure of too many divers. But there are still some concentrations of up to a half dozen anemones.

A tiny cave nearby was filled with the largest school of silver sweepers I had ever encountered. These transparent fish, only two to three inches long, fill some caves and crevices in schools of thousands, seemingly programmed by a brilliant choreographer.

BUT WAIT, THERE'S MORE

Not everyone will agree with these five choices. Advocates of Abu Nuhas, Carless Reef, Abu Rimata, Ras um Sid, or Zabarghad can come up with strong arguments for their favorites. But one thing they all will agree on is that the Red Sea deserves its reputation as one of the world's "don't miss" places. No diver's travels are complete without a visit there. 



"In the lobby was a wedding procession in full celebration.... Everyone danced to ancient pulsating rhythms.... The music was hypnotic and earthy, the visual spectacle, dazzling. We stood amid our dive bags transfixed."

Outside the tin walls at Sharm el Sheikh's airport the sun is merciless. From the surrounding desolation, people appear and cluster inside when a plane lands. However, the Sharm el Sheikh port agent, the person we are looking for, the man who knows where *Suellyn* is, is not there to meet us.

Our group — John and Ann, rice farmers from Arkansas; Dick, a photographer from Florida; Chuck, a gentleman farmer from Mississippi; Alan, a physician from Tennessee; and myself, leader of our merry little band — had flown from the States

into Cairo via Amsterdam the day before. My husband, Bob, would be a day late joining us.

We were met and gratefully herded through airport bureaucracy by Hussan, our Cairo agent and guide. In Egypt, a guide is a necessity not a luxury. With native savvy, Hussan acknowledged which official signs and regulations were to be heeded and which were to be ignored. He then took us to our Cairo hotel, negotiating with porters, cabs and desk clerks all the way.

There, our jet-lag vanished. In the lobby was a wedding procession

in full celebration. Three beautiful dark haired women in form fitting cobalt blue silk gowns preceded the bride and groom. Balanced on the women's heads were multi-tiered candelabras with lighted candles. Men in flowing white robes and colorful headpieces twirled sticks, beat drums and played native instruments. Everyone danced to ancient, pulsating rhythms. Children scattered rose petals and gold coins in their path for good luck. The music was hypnotic and earthy, the visual spectacle, dazzling. We stood amid our dive bags transfixed.

But now we are in Sharm el Sheikh and we are looking for our agent. "Excuse me, please, can you help me," I asked the glassy-eyed man behind the beat-up desk. "I am looking for the boat, *Suellyn*," I said, resisting the temptation to speak louder so he would understand English. It didn't matter. He was looking through me, the way many Egyptian men look through women.

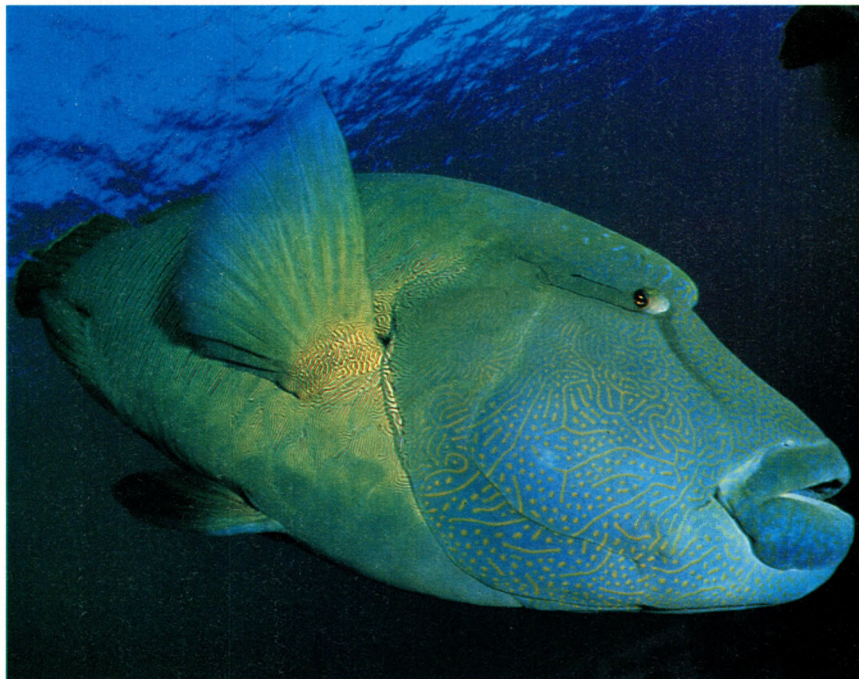
There was a thud and some yelling and two angry uniformed men hurled two other men against a wall. A real life show-down in the not-so-O.K. airport corral.

A cab driver appeared and made many gestures towards our dive bags and camera equipment. Our taxi was an old station wagon with seat stuffing erupting onto the floor boards.

A scraggly boy ran to fetch another metal ship-of-the-desert. The driver gestured for people to go in one cab, luggage in another. No, no, I gestured back, people and luggage go in both cars. I did not want to re-purchase our gear from the black market. The drivers did not seem to understand English, spoken by me or by anyone else. Charades of "boat" and various pronunciations of *Suellyn* (SOO-WHALE-EEN, SWHALEN, SWALYN) brought a slight smile, or

The Red Sea — an adventure no matter how you part it.

BY VALERIE MOORE



ANNE SOPHIE POZZOLI

Far from shy, this Napoleon wrasse checks for handouts.

maybe visions of large fares. We rumbled into the desert to look at everything near or on the water.

A WELCOME OASIS

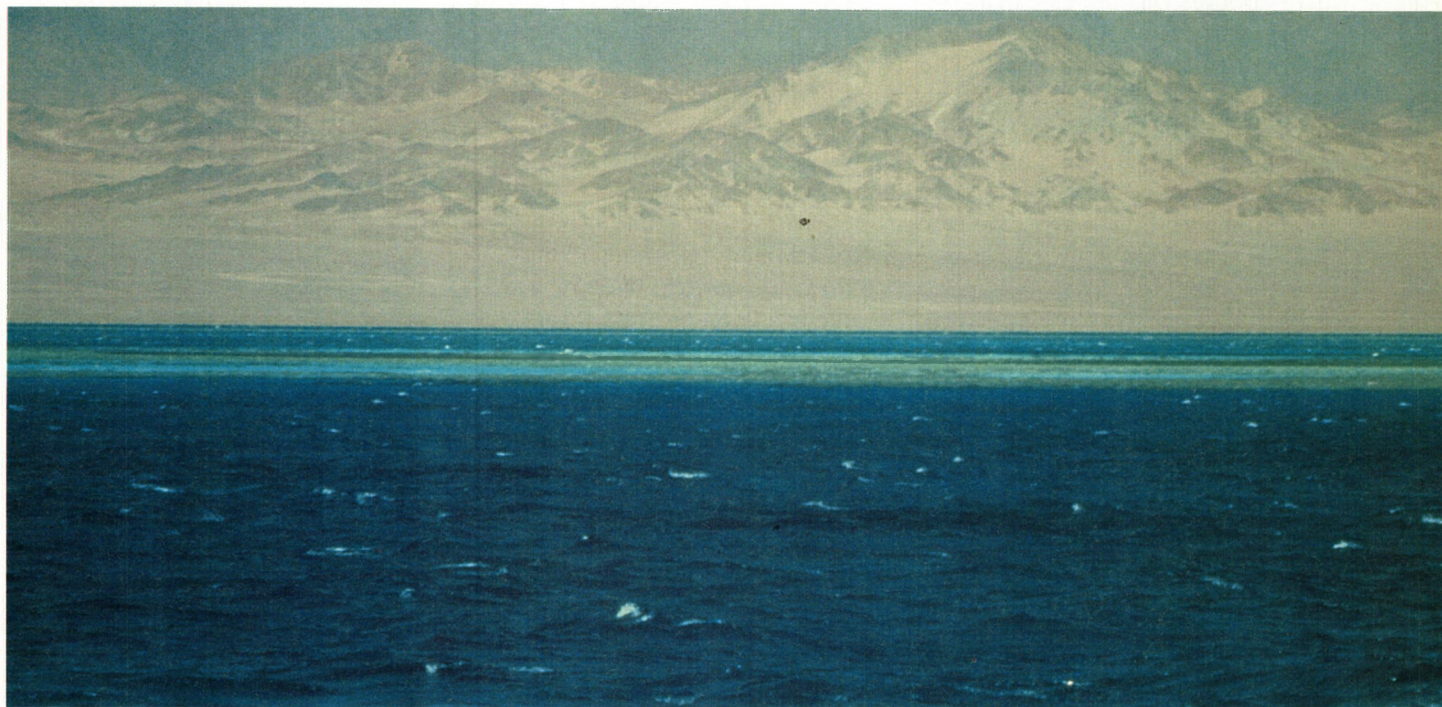
After an hour of charades, heat and nothing more than a beached dinghy, we demanded the drivers stop and unload us at the lobby of a resort that promised phones, food and shade. The young desk clerk,

port was guarded by someone in uniform, each guard looking hotter and more ill tempered than the one before. Abdul Wasab waved papers at each post until we were parked on a bleak and dirty dock. Abdul disappeared and left us in the van. We were surrounded by more guards, this time with guns. Apparently boarding an Israeli vessel from an Egyptian port calls for as much

groups was laughing on his way to the bank.

We eyed each other for a few moments. Man by nature is a territorial animal. Morris, *Suellyn's* young captain did not know what the agent had promised to all the passengers. After an eternity on the dock, *Suellyn* even with more passengers than expected, seemed like heaven.

All the "good" cabins had been



RIK SAWMON

Ras Muhammed, like many dive sites on the Red Sea, offers a stunning juxtaposition of desert and ocean.

who I later learned, was educated in Europe, spoke polite English. "Ah, yes, this agent, I have heard of him. We will call the port office. Oh, so sorry, it is Friday, a day of prayer. It is hard to find anyone in. No one at the agent's office wants to be responsible for taking a message. You can try later."

We were on our third cup of thick, sweet coffee planning alternatives for the future, when the desk clerk walked up and said, "Abdul Wasab, the port agent is looking for you. Your plane was not scheduled to arrive until later, so no one was there to collect you."

Half a day and much mental anguish later, Wasab had a van to take us to the port. We shared a single thought — find the elusive *Suellyn* and start diving. Each gate to the

delay and discomfort as possible. We conjectured how long it would take to fry an egg on the hood of the van. And still no boat in sight.

A BOAT LOAD

Finally, *Suellyn* glided around the bend. It was a relief to see her. We were made more than a little uncomfortable by our guards who took great delight in punctuating their chatter by jabbing their rifles in the air. We were surprised to see so many faces on *Suellyn's* deck. She either had a very large crew or we did not have the boat to ourselves, as promised. Later we learned that the Italians, who boarded *Suellyn* in Eilat, were as surprised to see us as we were to see them. Somewhere the booking agent who had chartered the "whole boat" to both

taken. "Good" meaning the ones that had room for clothes, gear and people all at the same time.

Morris, who was wearing a t-shirt that said "*Suellyn*, The Best Way Into the Red Sea Since Moses," wisely cranked up the engines and headed out to sea.

A RECREATIONAL MISSION

Shalom, our divemaster, former Israeli commando and presumed expert in the black arts, gave us our dive briefing. As leader of the American group, it was my ongoing mission to remind Shalom that we were here for fun and were not to be treated like military inductees.

"These people should be able to swim many meters against the current on snorkel to a reef," Shalom barked. "Why," I countered. "These people



"Anyone who has the privilege of diving the Red Sea quickly discovers that it is as beautiful below as it is barren above. It is a giant environmental flip-flop only appreciated by those who look beneath the surface."

are here for a vacation not for the Israeli equivalent of the Iron Man."

Shalom was to observe us closely on our first dives, and then having assessed our abilities as experienced divers, still barked strenuous dive profiles but did not insist on their enforcement. As "sport divers," we were not bad, after all. The cheerful Italians, however, were an underwater headache for Shalom and a topside nightmare for Morris as well.

No matter how many times the Italians geared up, it always seemed like the first time. They multiplied and took over the dive platform. There was always so much talking to do. A comedic version of a Verdi opera — loud, sprawled and overly costumed — they wore many instruments, but didn't pay any attention to them.

Claudio's arm looked like a control console. He had one of everything except a pressure gauge — apparently knowing how much air he had took the adventure out of the sport. No octopus either. Every dive plan had the same objective: the farther, faster and longer, the better. The dive was over when their bottles ran dry.

FIRST IMMERSIONS

One of our first new underwater friends was a Napoleon wrasse — a beautiful blue-green fish with Marty Feldman roll-around eyes, approximately the size of a small Volkswagen. He traveled with a remora attached and had an extreme fondness for hard-boiled eggs. For October, we were delighted to find the water clearer and warmer than expected, around 80 degrees F. Graceful lionfish, with their proud and poisonous plumage, hung up side down. We ascended, almost an hour later, refreshed and ready for more.

Anyone who has the privilege of diving the Red Sea quickly discovers

that it is as beautiful below as it is barren above. It is a giant environmental flip-flop only appreciated by those who look beneath the surface.

Curtains of copper sweepers part to unveil soft corals, while tiny orange fish, like bursts of sunlight, dance above coral heads encrusted with untold years of growth. Butterfly fish are abundant and huge — there are many varieties and they always seem to swim in pairs. Some are as large as saucers.

We found a stone fish, a most curious fellow, hobbling along with a frown on his face. We saw a crocodile fish lying on the bottom, only his marble eyes following our movements. Majestic lionfish are omni-present with the "you can look but don't touch" air of a true feline.

WATER, WATER EVERYWHERE

Part of Morris' "welcome aboard" briefing included the customary house rules for live-aboards, in particular, the necessity for military-style "spit bath" showers in a land where fresh water is as precious as gold. Morris gave the briefing to the Italians when they boarded in Eilat and to our group when we boarded in Sharm El Sheikh.

The fastidiously clean Italians paid as much attention to Morris as they did to Shalom. Consequently, to coincide with our arrival on board, *Suellyn* ran out of water. Normally, a boat would simply pull into a port, fill up and go on. Not so for an Israeli boat in Egyptian waters. The Egyptians would not give us or sell us any water. Morris wisely reserved enough for cooking and then turned all the taps off, except for one spigot that dripped rusty water for 18 passengers and crew to brush their teeth.

Sea baths can be somewhat satisfactory when need dictates, but in the Red Sea where the salt content is very high, a sea bath only refresh-

es for a long as one stays in the sea. After that, there is one more layer of soap and sea salt to contend with. Combs would not go through our hair, our bathing suits were streaked with salt trails and cracked



RICK HEYDEL

when we walked, and our skin had the soft and supple texture of sand paper.

A MIXED BAG

The next morning we returned to Sharm el Sheikh to pick up Bob,

but not his dive bag.

In one of the most glorious places on earth to dive, Bob is without gear. Passengers and crew sort through available equipment to find "spares," Bob's size 13 feet reluctantly fold into size 11 fins.

Although *Suellyn's* passengers and crew are very diverse, we are melding into a harmonious group. Morris, our captain, got his experi-

in the ocean at specified coordinates and Shalom would go to work. Morris said he never asked the nature of Shalom's projects.

One lazy evening, Shalom was playing with a dive knife in the galley and pronounced it "very well balanced, good for throwing, but Morris would probably not appreciate the holes in the teak".

Elena, our stewardess, was born

bombs at night.

What we thought were good-luck bracelets on her wrists were in reality the O-rings used in making the bombs at the kibbutz. We're definitely not in Kansas anymore, Toto.

Vesa was one of our deck hands. An albino from Finland, he was a whale in the water. When he guided our dives, we had to be care-



Seemingly stoic, a scorpionfish stakes out its territory on Daedalus Reef.

ence in the Israeli army on patrol boats. That's where he met Shalom.

Legend goes that if the military wanted someone "taken out of the game" Shalom was the person to do the job. Morris used to drop him off

in Holland. Blond, Amazonian in stature and attractive in a wild, earthy way, she wore a diamond in her nose. Elena spent seven months in a kibbutz, growing avocados and oranges in the day and making

ful of collisions. His radar seemed permanently askew.

The dive was over when he got to 500 PSI which was always long before anyone else had even sucked half a bottle. Soon, we exchanged



"Our wake up calls are always different and exciting. Some mornings, we awake to a peeping sound and are greeted by the soft mauve sunrise silhouetting a falcon who sits atop the flagpole."

hand signals that crossed all international barriers and did nothing to promote detente, but at least we got to stay in the water longer.

CAT NAPS

Since our cabins are too small for people, several of us have taken to sleeping on *Suellyn's* spacious deck, wrapped in blankets and lined up like wieners on a grill. Our wake up calls are always different and exciting. Some mornings, we awake to a peeping sound and are greeted by the soft mauve sunrise silhouetting a

the falcon's departure. We congratulate each other — Tourists One, Falcons zero.

One day we wake to the sound of a holy man who chants to the pre-dawn. His ancient strains echo and bounce through the barren rocks as we lay beneath the fading stars. Still other mornings we wake to the sound of gunfire.

IN THE BAG

Our return to the now familiar port of Sharm el Sheikh has a dual purpose. Bob's dive bag has been

found but it is not at the dock. It is coming. Sometime.

The anticipation mounts as a once-white station wagon on four may-pop tires chugs up the pier. Four people droop out. Is the bag in the trunk? In the back seat? The oblivious agent chats with a guard. Slowly someone reaches into the back and pulls out — oh my gosh! a red and black dive bag!

Bob is summoned to open it for inspection. Dark eyes scrutinize it for irregularities — perhaps they think it is the Lost Ark. Bob's strobe and camera bag are missing. The rest of his possessions, including all his dive gear, are still there. The lock is in place, but the plastic tab has been broken so it could be slipped out. We are quite amazed to see the bag at all.

A MAGIC PLACE

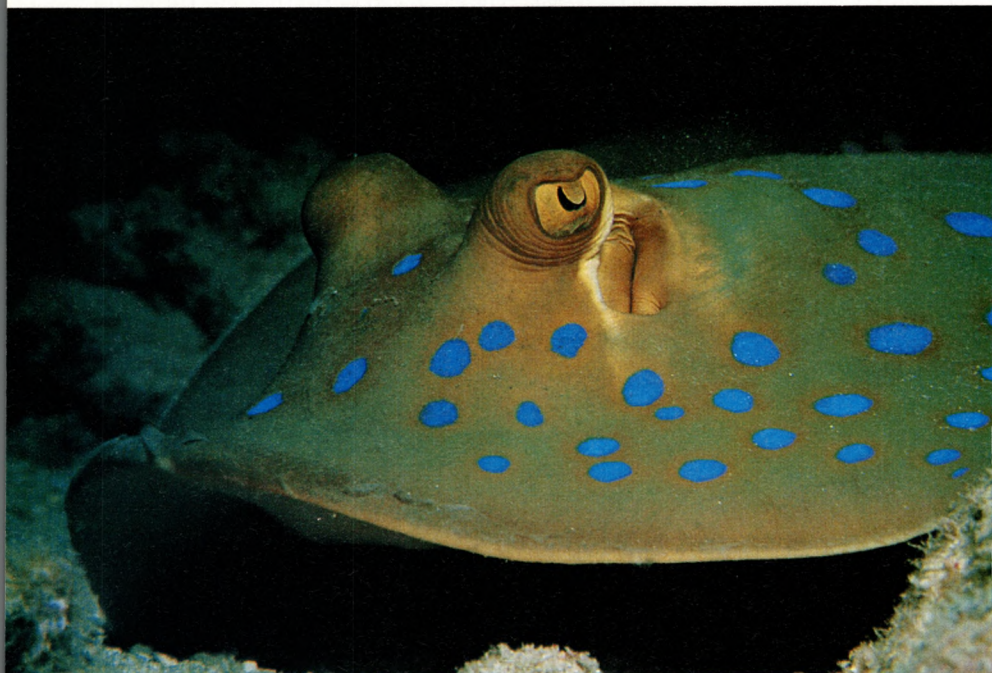
Suellyn is much bigger now. We miss our friends but preparing to dive is so much easier. The crew is more relaxed. They take us to special places like Ras Za'atir where they would not take less experienced divers.

Ras Za'atir is a magic place. The reef is a wealth of color. The grottoes are magnificent. Soft corals in deep purples, yellows and oranges grow abundantly everywhere. The coral has grown into cathedral-like buttresses allowing shafts of sunlight to illuminate an even more spectacular array of fish. They pose in the grottoes, as we immortalize them on film.

Curtains of copper sweepers dazzle us as they turn and reflect the sun. Every turn of the head, every slight change of depth produces a new and stunning visual array. Ras Za'atir is a fantasy beneath the sea — a religious experience in an underwater cathedral.

A RELUCTANT FAREWELL

All our dives were memorable, and for many different reasons. We



JESSE CANEIMO

Night dives allow for chance encounters with creatures such as this blue spotted stingray.

falcon who sits atop the flagpole.

Itzhack, Morris' young blue-eyed siamese cat, crouches on point, mesmerized. Chuck and Dick snap photos as Itzhack foolishly stalks the falcon. We frantically struggle out of our mummy-like cocoons to throw ourselves between Itzhack and the falcon. Our visitor, momentarily outnumbered by the save-the-kitty contingency, flies away without his Siamese snack. Itzhack, happily unaware, looks disappointed by

found and the Italians are scheduled to leave. We will miss our European friends — lusty Claudio who could not keep his hands off Elena, quiet Marina, pleasant Alberto, Maximo with his incredible eyes and Marcello who wants to come to America and become a rice farmer and be John's number two man.

There are many uniformed Egyptians on the dock. They all have walkie-talkies. Maybe they even have batteries. Bob and the agent are discussing the dive bag. It has been

Walls of moving color, liquid clouds of life. The Red Sea is known for both the abundance and diversity of its inhabitants.

surfaced after a dive at Ras um Sid and looked deep into the gun barrels of an Egyptian patrol boat. Our zodiac's engine failed, and much to the amusement of the Egyptians, we rowed back to *Suellyn* using one oar and two fins.

A sweet-sad feeling touches our little group as our time on board comes to an end. What seemed to be major problems on arrival have become adventures.

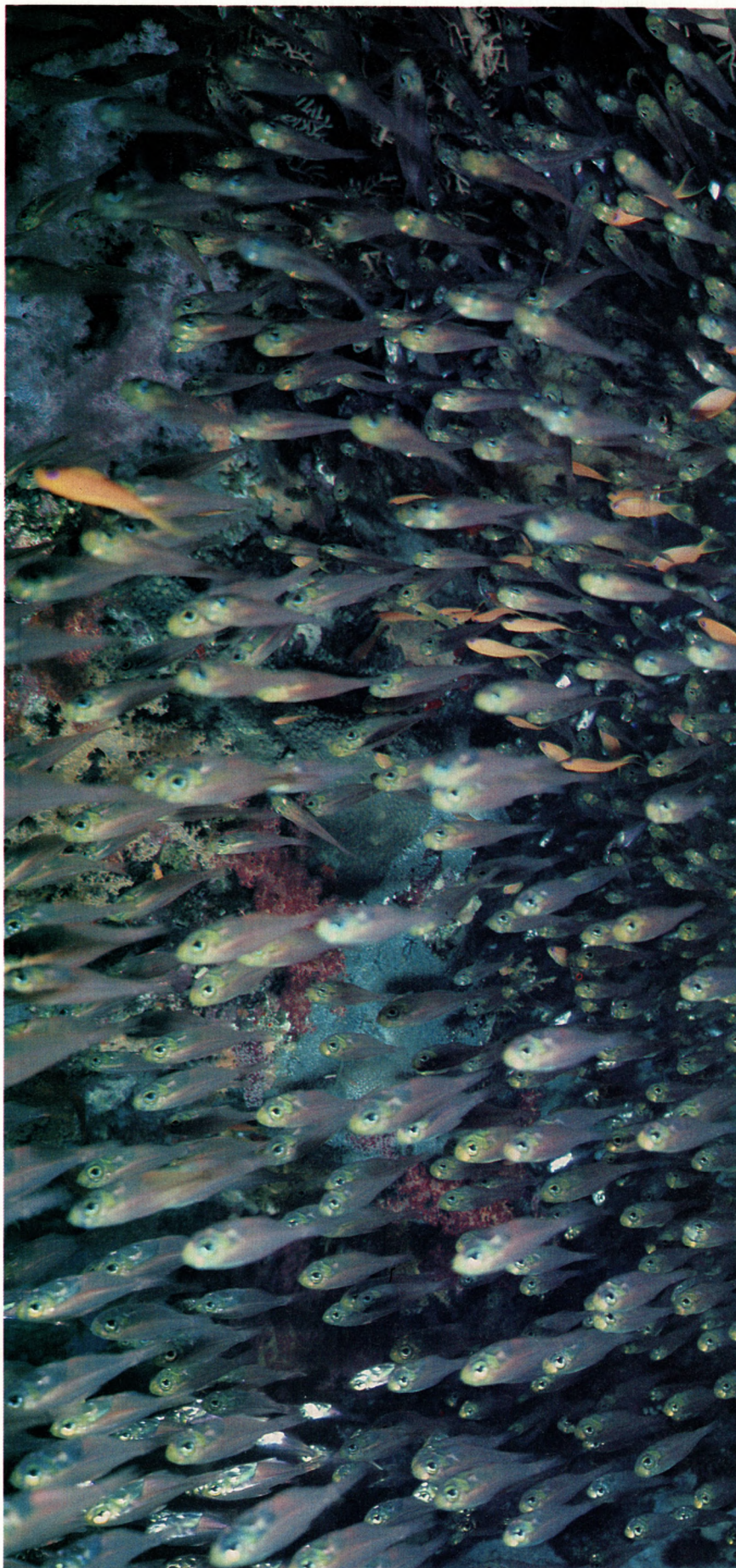
I even think the crew will miss us when we leave. Elena is learning to scuba dive from Shalom. Shalom, I believe is a puppy in camouflage. Itzhack, I dearly love. The falcons (or as Morris calls them "fish-hawks") love Itzhack, too. I hope he has many lives left — the fish-hawks are a lot larger than he is.

"The Temple" is appropriately our last dive because it is where our Red Sea diving adventures began. Shalom half-heartedly barks a dive profile, very similar to the our usual "dive and see" manner of operating but adds "meet me at the large sea fan in 15 minutes. I will have a surprise for you."

We say good-bye to our finned friends, who gently circle us for the last time, "our" wrasse is there, still scanning our BC pockets for hard-boiled eggs. It is a relaxing last dive.

Shalom is at the big sea fan — a sign and a bottle of wine in one hand and Elena, a beautiful vision in scuba gear, firmly secured in the other. The sign says "We love you, The Crew." Shalom attempts to drink from the wine bottle and pass it to the rest of us for an underwater farewell libation. Perhaps it is an old Israeli commando diving custom. The buoyant sign floats off. We applaud Shalom and Elena for their efforts and begin the world's slowest ascent. We are in no hurry to leave. ■

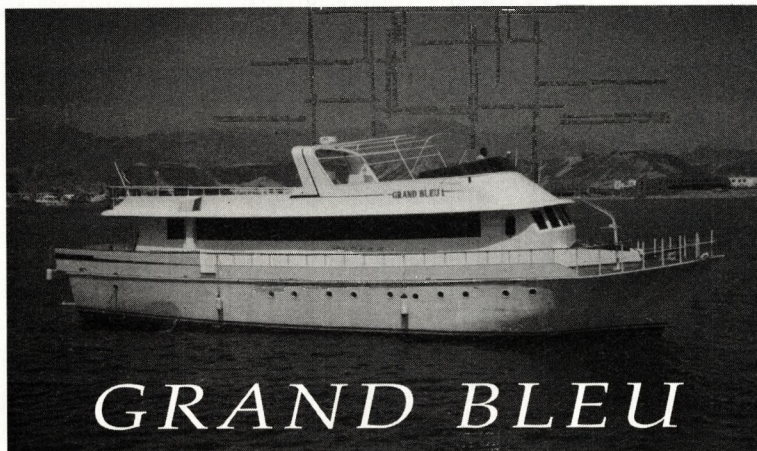
Adventure-seeker and veteran writer Valerie Moore can't wait for her next opportunity to visit the Red Sea.



BRET CHILMAN

RED SEA

"The Dream Destination"



GRAND BLEU

- 82 feet of comfort.
- 8 private double cabins.
- 12 diver maximum.
- Private ensuite bathrooms.
- Weekly departures from Sharm el Sheikh.
- Only \$1395 per person.

15 days - \$3775

- Airfare from New York
- All flights within Egypt
- 3 nights Cairo Hotel
- 4 nights Nile Cruise - Aswan/Luxor
- 6 days touring Cairo/Aswan/Luxor
- 7 nights *Grand Bleu* live-aboard
- 14 breakfasts, 13 lunches, 11 dinners
- Taxes, service charges, transfers, etc.

13 days - \$3125

- Airfare from New York
- All flights within Egypt
- 4 nights Cairo Hotel
- 2 days touring Cairo
- 7 nights *Grand Bleu* live-aboard
- 11 breakfasts, 8 lunches, 8 dinners
- Taxes, service charges, transfers, etc.

Above package include 5-star hotels, 5-star Nile Cruise vessels, Cairo tours on private car basis, certified Egyptologist guides, personalized assistance throughout.

Prices are based upon double occupancy accommodations.

EGYPTAIR
 Request our Free
 Egyptian Red Sea brochure
 Land-based and Live aboards
 15 years Red Sea experience

 **TROPICAL
ADVENTURES**
TRAVEL

800-247-3483

WA (206) 441-3483 • FAX (206) 441-5431

3542*3/94

Scuba Gear Made Clear

We'd just finished a shore dive at a popular site and were soaking up some sun. Around us, two dozen divers and their gear covered picnic tables and a stone patio at the waters edge.

This tranquil scene was suddenly interrupted by the nearby hiss of a free-flowing second stage, accompanied by a string of four letter words. The vocal diver tried the "usual" remedies: turning the air on and off, fiddling with the purge button, banging on the second stage and then cursing some more.

I started to offer help when an enthusiastic fellow diver intervened.

"I know what's the problem, your interstage pressure's too high. I'll bet it's a bad pressure seat." He rummaged through his tool box and came out with a crescent wrench and a pair of pliers as he explained the intricacies and mysteries of regulator design.

He managed to loosen the cover plate before encountering a spring keeper that required a special tool for removal. Temporarily thwarted, he then resorted to a screwdriver in an attempt to "dial in" the intermediate pressure.

After these "adjustments," the regulator still free-flowed. And, the chromed first stage was not only scratched by the pliers, but its warranty had just been voided.

I offered a spare to the unfortunate regulator owner — as much out of curiosity as altruism — and examined his regulator while he went diving. Turns out the only thing wrong was a stuck second stage poppet — something routine maintenance would prevent, and a trip to a qualified repair

technician would solve.

Like our friends in this encounter, far too many divers are guilty of gear ignorance and negligence, while a lesser number fall victim to the "weekend expert" syndrome. Both types could benefit from a little education.

One of the best ways to get this education is through an equipment specialty course such as those offered by PADI, NAUI, SSI and other certification agencies.

Typically, an equipment specialty course is available to any open water diver with a "basic" certification or beyond, and may involve one or more classroom sessions and often some water work.

Most classes cover the theory and workings of scuba gear, but the goal isn't to become your own scuba technician. Instead, lessons concentrate on ways to get the best possible performance from your equipment, and on how to provide the proper care, maintenance and service for each piece of gear.

The lessons learned in these courses are not designed to be complex or confusing and they don't require a bag of specialty tools and a workbench to complete. Instead, they are intended to take the mystery out of scuba gear by providing you with a basic knowledge of how each piece of equipment functions — and malfunctions.

Sign up for an equipment specialty course and you will not only learn to keep your gear working and looking good, you will also become a more competent, informed diver. And, you'll never fall victim to a "weekend expert" again.

—Pierce Hoover

Dive Locker

Want to really go off the deep end? Check out the *Test Dive* section for the personal submarine we discovered at this year's DEMA show. The guys at Sea Urchin have their training facility up and running in Vancouver, and there are several more sites in the works, so stay tuned.

Do your kids beg for some "real" dive gear like mom's and dad's? If so, you might want to look at a set of Guppy Gear. This new product line has drawn a lot of attention from the national children's media in the past couple of months, and our own junior test diver also gave it a thumbs up.

The only problem we seem to be having with the staff gear tests is we like some of the products so well, we end up buying them ourselves.

The last thing our "gear junkie" editor needed was another BC. But after trying the Zeagle Ranger for a couple of weeks, he pulled out the checkbook. "It's such a sweet design, I couldn't help it," he says.

Veteran dive educator Bob Sheridan sheds some light on the often ignored question of tank, manifold and regulator compatibility in *Head to Head*. He sets the record straight on pressurization limits and clears up some confusion over the new "high-pressure" system. He also points out some cases where gear is being pressed into service above and beyond its design specifications.

If you've got some spare cash and want a high-end DPV, have a look in *Innovations* at the Retro, which is just one member of an exciting new class of DPVs that came on the market this year.

Back on the *Just Surfaced* page, you'll find a nifty replacement for spiral wrap that's equally kind to hoses and a lot easier to work with, discover an alternative to chemical light sticks and also get the word on a new line of diving-specific first aid products.

Equipment

TEST DIVE

Personal submersible, heavy-duty BC and regulator, depth gauge, and snorkel gear

Sea Urchin Submersible

I built my first personal submarine at the age of eight. The hull was made by Kenmore, and in a previous life had heated water. And although I am now disguised as a responsible adult, the childhood dream of exploring mysterious ocean depths in a personal submersible hasn't been forgotten.

A few months ago, I turned this life-long daydream into a reality in a Sea Urchin Submersible.

Canadian-based Sea Urchin was founded to develop and market a one man submersible. Working in partnership with Hard Suits International, Sea Urchin drew from the innovative technology used in the Newt Suit — the one-atmosphere pressure suit that looks a bit like the Michelin Man and allows divers to perform deep dives without decompression.

The result of this collaboration is a submersible vehicle capable of operating to depths of 1,000 feet for up to five hours. It can be trailered behind a car and launched from a boat ramp, but the

Sea Urchin is far from a toy. In fact, it is certifiable as a manned submersible by the American Bureau of Shipping, and is required to undergo the same rigorous test as larger military and scientific submersibles.

Anyone with a basic interest in engineering will appreciate the clever simplicity of the Sea Urchin design. The life-support system, for example, uses a blower to circulate cabin air through a CO₂ absorption filter, along with a simplistic bellows-driven demand regulator that adds fresh oxygen in proportion to the waste CO₂ that is removed. Override and backup systems including an oral/nasal mask provide for virtually any combination of equipment malfunctions, and provide up to 60 hours of emergency life support.

Hard and soft ballast tanks create 1,000 pounds of positive buoyancy while the sub is on the surface, and allow it to be trimmed easily for neutral buoyancy while underway. Should any system fail, the operator can simply drop a heavy keel section to make the sub fully positive — even with all ballast tanks flooded.

So what was it like? My dive took

place in a training tank at a commercial diving facility. I was operating the working prototype rather than the production model, which will be several inches wider and a foot longer on the inside.

My six-foot-three frame was a bit crowded in the prototype, but I could reach all controls and valves easily. Reclining on a padded belly rest, I looked out the 180-degree front port into a world that was magically magnified and subtly curved by the dome's spherical surface.

There were relatively few controls and readouts to monitor. An oxygen sensor and barometric gauge provided air quality information, and gauge readouts show remaining ballast, air and battery life. Control valves allowed me to flood and purge the ballast chambers to control depth and trim, and toggle switches controlled the thruster motors.

Descending felt a bit like flying — or wearing a huge BC. Dump air to go down, add air to hover or rise. Use the

Descending felt a bit like flying — or wearing a huge BC. Dump air to go down, add air to hover or rise. Use the motors to move forward or change direction.



TEST DIVE

motors to move forward or change direction. I got the hang of it quickly, and soon wished I was on a coral reef rather than in a training tank.

When production models of the Sea Urchin become available next year, the relatively low retail price (\$125,000 as opposed to a million or more for similar subs) will undoubtedly attract interest from light commercial operations and research outfits.

What makes the Sea Urchin attractive to the sport diver, however, is an innovative training and rental/lease program that Sea Urchin is now organizing.

Presently, the company is handling all training and "sub rides" from their Vancouver facility, but they expect to sell a number of units to resort properties in the Caribbean and Pacific. When in place, these training facilities will bring personal submersibles to the general public. For around \$200, you will be given training and a check out trip in the Sea Urchin, and can also rent sub time at rates comparable to those for a small private aircraft.

For a lot of amateur explorers, this could be the chance to take up the adventure where those water-heater "submarines" of our childhood left off.

For more information, contact Sea Urchin Submersibles, 4534 West First Ave., Vancouver BC, V6R 1H8, Canada. Phone (604) 224-9100. —Pierce Hoover

Zeagle Ranger

I make trips to clear tropical waters whenever time and finances permit. The rest of the time, I dive closer to home in "less ideal" conditions — and have just as much fun. This may involve activities such as sneaking along a deep ledge with a speargun or rooting through river mud in search of souvenirs.

For this type of diving, the colorful skin suits and high performance "resort gear" stay in the bag, and I instead pull out faded and tattered wetsuit parts, a heavy, old-fashioned regulator that never dies and a wing-style BC adorned with cable ties and extra D rings to hold keeper cords, catch bags, tools and lights.

That vintage BC has seen a lot of hard use, and it's about ready for retirement. It's replacement will be a Ranger BC from Zeagle.

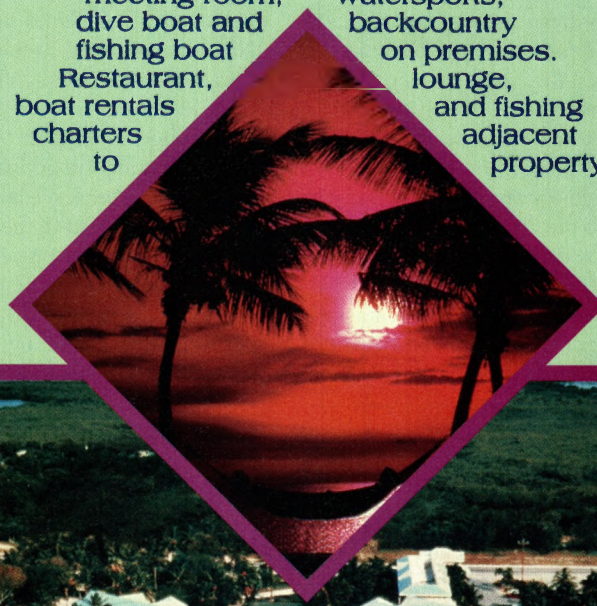
I've used a number of Zeagle products in the past, and have always admired the innovative weight system. Zeagle's use of quick-release weight



CHESAPEAKE RESORT

A TOUCH OF BERMUDA IN THE KEYS

Oceanfront suites with in-room jacuzzi, oceanfront guest rooms, garden view units and villas with kitchens (efficiencies 1 and 2 bedroom units). Two heated swimming pools, jacuzzi, saltwater lagoon, sunning beach, tennis, gym, meeting room, watersports, dive boat and backcountry on premises. fishing boat lounge, Restaurant, and fishing boat rentals adjacent to charters property.



83409 Overseas Hwy • P.O. Box 909
Islamorada, Florida Keys 33036
(305) 664-4662 • Fax (305) 664-8595
(800) 338-3395

Free information circle 35 on reader service card

TEST DIVE



pockets in a wing-style BC jacket makes for superb buoyancy control and trim. In addition, the modular design allows the diver to adjust the jacket for a custom fit.

The new Ranger incorporates the same features as other Zeagle BCs, but it also has "attitude." In other words, it's tough enough for any diving chore you want to dish out.

To cope with abrasive situations, Zeagle uses heavy-duty 1050 denier ballistic cloth for the jacket and wings. All stitching appears to be well-finished, with good reinforcement in critical areas.

There is ample storage capacity in the expanding gear pockets which flank the integrated weight storage, as the "bonus" pouch that rolls up when not in use and opens to hold backup lights and tools. The shoulder and waist D-rings are also useful additions that make secure mounting points for goody bags, lights, cameras or stage bottles.

I've used a variety of wings and wing-style BCs over the years for both single and double tank applications. The Zeagle design is one of the finest I've encountered for combining lift capacity with air control and streamlining.

Expansion panels and an elastic tension strip maintain a low-profile when the wings are deflated and, when partially inflated, prevent the air shift common to similar designs. The Ranger provides 38 pounds of buoyancy, plenty for supporting a large tank or extra gear — or for offsetting the buoyancy loss when diving with a thick wetsuit.

While evaluating the Ranger, I also had the chance to put Zeagle's Octo+ MK II inflator/second stage and their Tech-50D regulator to the test. The Octo+ attaches to the low pressure inflator hose, and is one of the smoothest

breathing members of this hybrid family that I am aware of.

The Tech-50D first stage offers such high-performance features as the option of a 300 Bar DIN fitting and four low pressure ports including a half-inch preferred port for a high-flow hose. A unique pressure sensing membrane on the first stage creates an environmental seal without the mess of silicon filling.

Based on my trial dives and bench examinations, the 50D would seem to be a good choice for harsh diving environments such as cold or silty waters. This regulator is definitely a contender that can hold its own with the big names in high-performance breathing gear, and if I ever get the urge to replace my "work horse" regulator, I'd certainly give the 50D a good hard look.

In the case of the Ranger, it's a slam-dunk choice. In the diving environments I plan to use it in, where hard regular use is a given, it offers a rare combination of durability, lift capacity and streamlining. I can think of no other BC currently on the market that fits my "local" diving needs as well as the Ranger does.

For more information, contact Zeagle

Be more than just a number.

Dive with Aqua'nauts, Grand Cayman's most progressive dive facility and enjoy personalized service in small groups.



- Full service PADI Dive Center
- Resort Courses
- 3 boats—trips to Stingray City & all of Cayman's exciting walls
- AM & PM 2-tank dive
- Night dives
- Charters
- Dealers for Dacor, Oceanic & Sherwood



For more information call toll free

1-800-357-2212

Extension 0003

P.O. Box 30147, Grand Cayman, BWI
Telephone (809)945-1990/Fax (809)945-1991

ENRICHED AIR

- ANDI SafeAir Training Facility
- IAND EANx Training Facility
- PADI International Resort
- 24-Hour Fills & Delivery Service

Richard C. Neumann
Owner & Trainer



NITROX TROPICAL DIVERS®
P.O. Box 1255, Kapaa, HI 96746

FREE Call for FREE Info

1-800-695-DIVE



**The National
Arbor Day Foundation**

96,000 acres of irreplaceable rain forest are being burned every day. Join The National Arbor Day Foundation and support Rain Forest Rescue to help stop the destruction. Call now.

**Call Rain Forest Rescue NOW.
1-800-255-5500**

TEST DIVE

Systems, 37150 Chancey Road, Zephyrhills, FL 33541, Phone (813) 782-5568, fax (813) 782-5569. — *Pierce Hoover*

Scubapro SG-12 Depth Gauge

Your first dive was beautiful. You've climbed back on the boat and started taking off gear when you notice it's happened. Sometime between the time you surfaced and boarded the boat, your computer has inexplicably shut down. Now that's not necessarily a problem if you see it quit. You can quickly check your watch and, assuming you know your maximum depth, calculate the dive using your tables. But what if you don't notice until just before the next dive?

No one wants to sit out the remaining dives, but without the correct dive profile, you're out of luck. Maybe not. A back-up computer may not be financially possible on your dive budget, but the SG-12 electronic gauge from Scubapro certainly is. Retailing for \$168, this combination depth gauge and bottom timer can be a wise investment.



The SG-12 offers three modes that are bound to be a big hit with recreational divers. The dive mode displays your current and maximum depths and the duration of the dive in minutes. The gauge also indicates repetitive dives and flashes a display if you ascend too quickly. After the dive, the SG-12 tracks your surface interval and displays the current temperature while

in surface mode.

The history mode offers a detailed log of the last six dives. Available information includes maximum depths, dive durations, surface intervals and repetitive dive indicators. This mode also records the maximum depth ever reached using the gauge, the total number of dives performed and the total hours of operation.

Modes are easily toggled by pressing moist fingers to contacts on the face of the gauge. These same contacts make it impossible to forget to turn on the SG-12. Scubapro recommends you turn the gauge on manually prior to the dive as part of your equipment check. But in case you forget, like many dive computers, it will turn itself on after a few seconds in the water.

Essentially, with the exception of decompression information, the SG-12 provides all the same information a dive computer does. In fact, gauge depth readings matched well with those of my dive computer, analog depth gauge and watch. And, the display is large enough to be easily read and is simple to interpret. The SG-12 can be inserted in Scubapro's V.I.P. 2

Dive Safe, Dive Fun, IANTD is for Everyone!

Join the founding Nitrox and Technical organization for recreational divers—The International Association of Nitrox & Technical Divers.



Diver and instructor certifications are available in EAN Nitrox; Advanced Nitrox; Nitrox Technical; Trimix; Deep Air; Advanced Deep Air; Technical Deep Air; Gas Mixing; EAN and/or Air Overhead Environment; Cave and Wreck Penetration Diving.

Annual Membership Dues: \$40 US/\$50 International. Includes subscription to the IANTD Journal which is published quarterly.

To receive an international listing of IANTD facilities and instructors, send \$5.75 to IANTD World Headquarters, 9628 N.E. 2nd Avenue, Suite D, Miami Shores, FL 33138-2767.

Check, Money Order, VISA and MasterCard accepted.

305-751-4873 • Fax 305-751-3958

Free information circle 56 on reader service card



Divers

MT. PLEASANT GUEST HOUSE SALT CAY

Have

- ☐
- ☐
- ☐
- ☐
- ☐
- ☐
- ☐
- ☐
- ☐

- Cattleboats
- Lousy Food
- Noisy Nightlife
- Limited Visibility
- Man-Eating Mosquitos
- Beat Up Coral
- Surly Natives
- Hostile Crew
- Long Trips to Dive Sites

Don't Have

- ☒
- ☒
- ☒
- ☒
- ☒
- ☒
- ☒
- ☒
- ☒

What we do have is great diving, two boats—no waiting, sensational food, the friendliest people in the Caribbean, and even fun things for non-divers: horseback riding, shelling.

For reservations and further information:
Direct **809-946-6927** or



Sea Safaris

1-800-821-6670 (U.S. & Canada)

Free information circle 77 on reader service card

TEST DIVE

and V.I.P. 3 consoles or mounted in a rubber wrist strap.

Donning the wrist unit is incredibly easy and designed for one-handed adjustment. The trick is getting the unit off your wrist. Actually, if you press the release tab and remember to pull the unit away from your wrist instead of tugging on the band, removal isn't as difficult.

Whether you use it as a backup to a computer or as a primary recording device, Scubapro's reasonably-priced SG-12 is a great way to keep track of vital dive information. With an operational depth limit of 295 feet, the gauge is more than adequate for recreational applications. For more information on the SG-12 or your nearest Scubapro dealer, call (800) GO-SCUBA. —Vince Rhodes



Guppy Gear

"The Guppy Gear mask was really comfortable because it fit the size of my face. It is a lot better than my old mask and the rubber felt really soft. It was like having my face in a pile of Jell-O.

"The fins were easy to fit on my foot. Once my dad showed me how, I could do it myself. The fins were fast. I felt as fast as a torpedo.

"I think other kids would like to have Guppy Gear. My friend Kyle lives by a spring. If he had Guppy Gear he would use it every day. He would see fish and could chase them." — Spence Gilman, age 8

Guppy Gear is the brainchild of Stan Rasocha, the president and founder of Marine Sports Designs, an engineering firm specializing in the development and manufacture of high-quality, affordable snorkeling gear for children.

His 17 years in the diving industry includes a stint as an engineering manager with Dacor, during which he developed the Pacer regulator and the Integra line of snorkeling products.

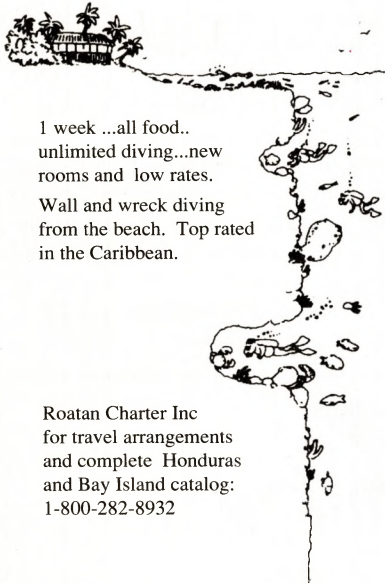
Guppy Gear was conceived as a high-quality youth line of "real" snorkeling gear that would look and perform more like "mom's and dad's" dive equipment than the "toy" gear typically available to youngsters.

The company is now in production with a full line of masks (Guppy Goggles), fins (Guppy Gliders) and snorkels (Guppy Gills), and will begin publishing the Guppy Gazette, a snorkeling newsletter for kids. The first issue is planned for the summer of 1994.

For more information on Guppy Gear, contact Marine Sports Designs, 1653 Barclay Blvd., Buffalo Grove, IL 60089. Phone (708) 215-8553, fax (708) 215-8559.

110foot wall

a snorkel away from the bar



1 week ...all food...
unlimited diving...new
rooms and low rates.

Wall and wreck diving
from the beach. Top rated
in the Caribbean.

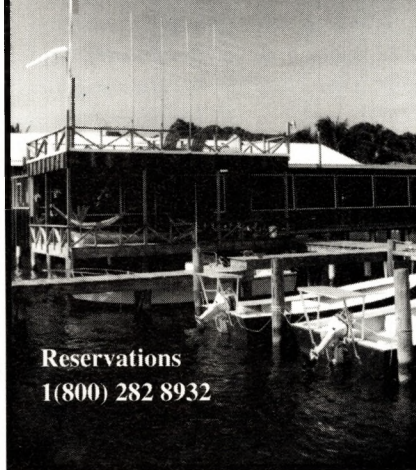
Roatan Charter Inc
for travel arrangements
and complete Honduras
and Bay Island catalog:
1-800-282-8932

CoCoVIEW RESORT

Roatan, Honduras Bay Islands

Utila Lodge and Marina HONDURAS BAY ISLANDS

A great little dive lodge
on a friendly laid-back
island. Eight air
conditioned rooms.
Hundreds of incredible
dive sites.



Reservations
1(800) 282 8932

HONDURAS

SCUBA DIVING
MAYAN RUINS
FISHING
RAFTING
RAIN FORESTS
JUNGLE EXPEDITIONS
BEACH HOUSE RENTALS



ROATAN CHARTER

1-800-282-8932

PO Box 877

San Antonio, FL 33576-0877

Free information circle 47 on reader service card

Equipment

HEAD TO HEAD

There are some important differences between DIN and yoke valve connections

What's the big deal about connecting a regulator to a tank valve? Most divers just want to get a "fill" and go diving.

But with the increasing number of higher-pressure scuba systems now on the market, divers who ignore equipment specifications and limitations increase the risk of equipment failure that could lead to air loss or a catastrophic accident.

The most visible aspect of these new higher pressure systems is the replacement of the traditional "yoke" tank valve with a DIN connection. The physical differences between yoke and DIN systems are obvious — you can't connect one to the other.

But there are also some less obvious differences that are equally important to the safe operation of your scuba system.

THE YOKE SYSTEM

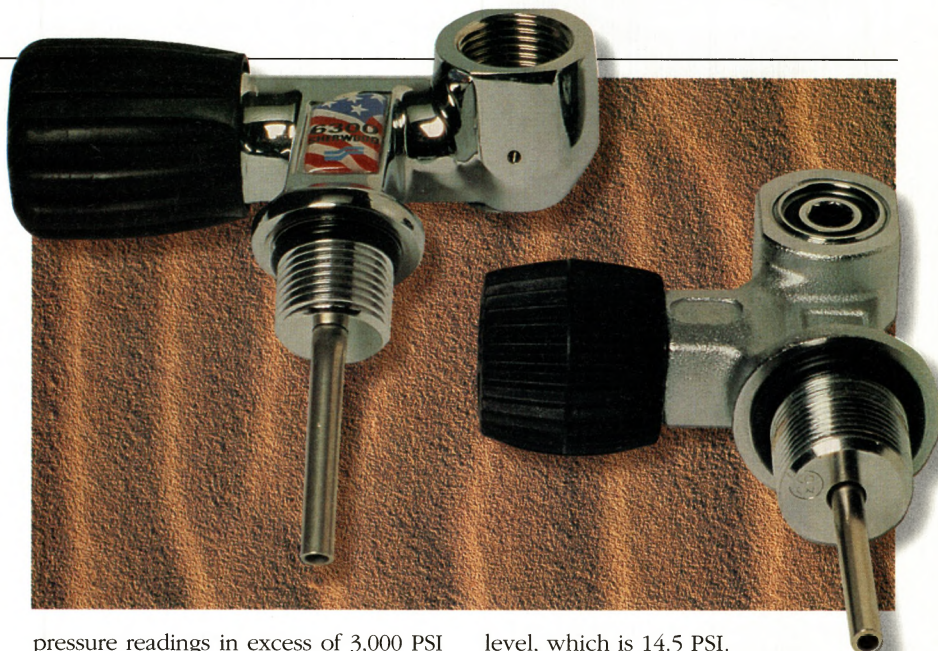
The yoke system now used for scuba tanks was actually developed during the construction of the Panama Canal, sometime around 1910, and it was designed for relatively low pressure use.

According to Bob Chaplin, national sales manager for Trelleborg Viking, "The yoke was developed to connect low pressure lines on gas lights used to illuminate the canal during construction." It wasn't until the 1940s that yoke regulators and valves were introduced into the United States.

The Department of Transportation and the CGA (Compressed Gas Association of the United States) have set limitations on the yoke regulator-to-valve connection system at a maximum working pressure of 3,000 PSI. This represents a far greater working pressure than the yoke system was originally designed for, but experience has proven it to be a generally acceptable and safe limit.

Extrusion problems ("blown O-rings") can happen at lower pressures — especially if the O-ring or manifold is damaged or worn — but such cases are relatively infrequent. As pressures exceed 3,000 PSI, however, failure becomes increasingly likely.

Some newer yoke valves may have



pressure readings in excess of 3,000 PSI stamped into them. This doesn't mean they can by law or should be used at higher working pressures. These markings actually relate to yoke distortion pressures and not yoke/regulator compatibility.

Early scuba regulators actually had 2,250/2,500 PSI working pressures. As a result, the tank valves associated with these older systems had thinner walls, and are even more likely to fail as pressures increase.

THE DIN INVASION

In Europe, it is a German organization, the DIN (Deutsches Institut fuer Normung) that has been most influential in setting standards for regulator and valve connections.

The DIN regulator/valve connection originated in Germany and it has been the standard in most European countries since the 1950s, according to Urban Rudolf of Poseidon Industri AB Sweden.

DIN 477 standards call for a captured O-ring seating system and a threaded connection. This is generally considered to be a safer, more reliable way of connecting regulators and valves at either low or high pressure.

DIN pressure ratings are typically expressed in bar rather than PSI. This should not be confusing if you simply remember that one bar is equivalent to normal atmospheric pressure at sea

level, which is 14.5 PSI.

There are two DIN connections currently in use for scuba tanks: 200 Bar (2,900 PSI) and 300 Bar (4,350 PSI). These differ in the thread length and depth of seating. For safety reasons the threads of the shorter DIN 200 regulator fitting will not seat in the DIN 300 valve.

And although the DIN 300 regulator connection can fit a DIN 200 valve, it is not recommended. Upon abusive over-filling of a lower pressure cylinder, the DIN 200 valve lacks the number of threads needed to safely hold the DIN 300 regulator fitting in place.

The DIN connection made its first appearance on the U.S. dive market in 1975 in the form of the Divator, a compact upside-down 4,400 PSI scuba system distributed by AGA. The valve system included a DIN 300 fitting to allow for a higher pressure rating.

In 1987, Sherwood showcased the new Genesis 3,500 PSI cylinder/regulator system which also used the 300 bar DIN connection. This was the first time an American manufacturer marketed a scuba system with a working pressure higher than 3,000 PSI. Rather than create a totally new high pressure valve/regu-

Divers who ignore equipment specifications and limitations increase the risk of equipment failure that could lead to air loss or a catastrophic accident.

"DIVE BANDS—THE TESTED ALTERNATIVE"



"DIVE BANDS" Keep your watch safe with added comfort. Non-absorbant backing repels water & perspiration, no rash—no problem. Dealer inquiries welcome.

D. Sea Int'l • 200 Walnut • Np. Bch, FL 32266
Ph. 904-246-4888 • Mail Order 407-777-5938

Free information circle 27 on reader service card

SEEK IT!



Proton 3
1,500 ft range.
LCD readout, fish,
150/300 ft cable,
just \$7465

Seek any iron or steel target and you will find it with this powerful Proton 3 magnetometer, the ultimate boat-towed U/W metal detector. Only from J.W. Fishers, the leader in reasonably priced, high tech underwater electronics. For details and pricing on over 20 products, including the world's finest U/W metal detectors, send for our **COMPLETE FREE CATALOG.**



JW FISHERS MFG. INC.
65 ANTHONY STREET
BERKLEY, MA 02779
1 (800) 822-4744
IN MA (508) 822-7330
FAX: (508) 880-8949

Free information circle 53 on reader service card

HEAD TO HEAD

lator connection to accomplish this, Jim Fox of Sherwood Technical Support states that "Sherwood elected to use the proven DIN 477 valve standards since their pressures exceeded 3,000 PSI.

Beuchat recently introduced 95-, 120- and 140-cubic-foot cylinders with a working pressure of 3190 and a 190-cubic-foot cylinder with a working pressure of 4,785 PSI. All are equipped with DIN 300 bar valves.

PROS AND CONS

One of the primary arguments in favor of the yoke system is it's universality and simplicity. The majority of North America —and much of the rest of the diving world — still relies on the yoke system. It's easy to connect and change, and most rental shops, charter boats and dive resorts feature yoke-equipped tanks with a maximum working pressure of 3,000 PSI.

DIN connections are mandatory at higher pressures. Period. There are other situations, however, when the advantages of the threaded connection and captured O-ring of a DIN valve could enhance safety even with working pressures below the 3,000 PSI threshold.

"Any time a valve or regulator is dropped or bumped, it should be inspected with great care" says Dick Boyd PhD., of Global Manufacturing. "I have seen yoke valves that were bumped lightly before a wreck dive result in a total air loss when the valve was bumped again on the wreck."

In more demanding scenarios such as cave, wreck, ice and deep diving, DIN connections are often preferred for the added security they provide. In some cases, divers select DIN fittings on tanks with working pressures of 3,000 PSI or less.

The presence of a high-pressure DIN connection does not sanction the diver to overfill these tanks past their rated working pressure, however. On a similar note, tanks with working pressures above 3,000 PSI are still limited to the 3,000 PSI maximum if equipped with a yoke connection.

Although yoke adapters are available for filling DIN cylinders, they should not be used at pressures above 3,000 PSI, or to connect DIN valves to standard yoke regulators. A number of DIN valves now on the market have the ability to convert to yoke use by means of a plug adapter which fits flush into the DIN valve.

EQUIPMENT COMPATIBILITY

Regulator compatibility is an addi-

tional item divers must consider with higher pressure scuba systems. Although DIN fittings can be installed in many regulators, not all regulators can handle the pressure being pumped into the cylinder.

For example, Sherwood regulators are rated to be compatible with their Genesis System at 3,500. Further pressure abuse voids the warranty and the high pressure seat becomes distorted. This can easily be seen by any repair technician.

Poseidon regulators, by contrast, are intended for a maximum pressure of 4,350 PSI/300 bar, and Beuchat designed their VX10 balanced diaphragm regulator for a working pressure of 4,500 PSI.

Some companies offer one or more high-pressure regulators along with a lower pressure line. For example, the Scubapro MK15 is designed for 300 bar use, and incorporates Hyperthane O-rings and an extruded high-pressure seat. "All other Scubapro regulators have a maximum working pressure of 3,500 PSI before increased service becomes necessary," says Rene Dupre, Scubapro's technical service manager.

Recommended working pressures may vary between regulators and manufacturers. Divers contemplating higher pressure systems should determine the recommended maximum for any equipment they now own and any they plan to purchase.

IN SUMMARY

The yoke system has a long history of service and a good overall safety record, but it was never intended for use in systems over 3,000 PSI.

Higher pressure applications require DIN fittings. In addition, all parts of the scuba system including the tank, valve and regulator must be designed and approved for use at the chosen working pressure. If there is a weak link in the chain, or if a component is pushed past its safe working pressure, you are leaving yourself open for problems.

Know your equipment, keep it maintained and stay within the working limits and you will enhance your underwater safety and the lifespan of your equipment. —Bob Sheridan

Bob Sheridan has been a dive instructor since 1968, and has been involved in a variety of underwater activities including research, motion picture special effects, scientific collecting, technical and institutional training and underwater archaeology.

In the world of technical diving, DPVs are more than a novelty, they are tools...

Retro DPV

DPVs are fairly straightforward. Put a battery pack and an electric motor in a watertight housing, bolt a propeller on the back and you're there. Simple enough — until you make increasing demands on the equipment, at which point seals begin to leak, motors flood and batteries fail.

In the world of technical diving, DPVs are more than a novelty, they are tools used to reduce work loads and transport heavily-laden divers to deep sites or into overhead environments. Like many cave explorers, Arnold Jackson logged a lot of hours on the workbench rebuilding and repairing DPVs — especially Tekna models.

Eventually, Jackson earned a reputation as a "scooter expert" and what started as favors to friends soon turned into a major sideline. Even the U.S. Navy was sending Jackson their military Teknas for rebuilds.

But there were limits to these modifications. The frequently rough treatment technical divers subject equipment to plays havoc on most DPVs, and even

with pressurized housings and additional internal ribs, few DPVs were suited for deep dives beyond 200 feet.

So Jackson set out to build a DPV that would withstand the rigors of technical diving. "We didn't want to reinvent the wheel" he recalls. "The Tekna used a real efficient eight-brush, permanent pole motor, so we stuck with that." Heavier shaft seals were added for depth along with an aluminum prop.

He also specified a thicker aluminum tubing for the torpedo-like body. The main reason for the shape wasn't streamlining, but to allow for deeper operation and eliminate the chance of a battery explosion from trapped gas.

Premium 18-amp-hour batteries were added, but the most significant increase in operating performance came from the addition of a circuit board that provided pulsating DC power.

This controller was designed for motorized wheelchairs, where reliability and battery life are key concerns. By adapting it to DPV use, Jackson not only created an infinitely variable electronic speed control, but also increased battery

life four fold.

The other characteristic that sets Jackson's DPVs apart is their operational depth limit. Chamber and in-water testing have proven the housing and seals to depths approaching 500 feet, and Jackson specifies a maximum rated working depth limit of 427 feet — well beyond the recommended recreational limit of 130 feet.

The technical community is already putting Jackson's design to the test. Several months ago, cave explorers were forced to abandon a Retro at a depth below 300 feet. When a recovery party returned a week later, the DPV had not only survived, but had enough juice to be ridden out of the cave.

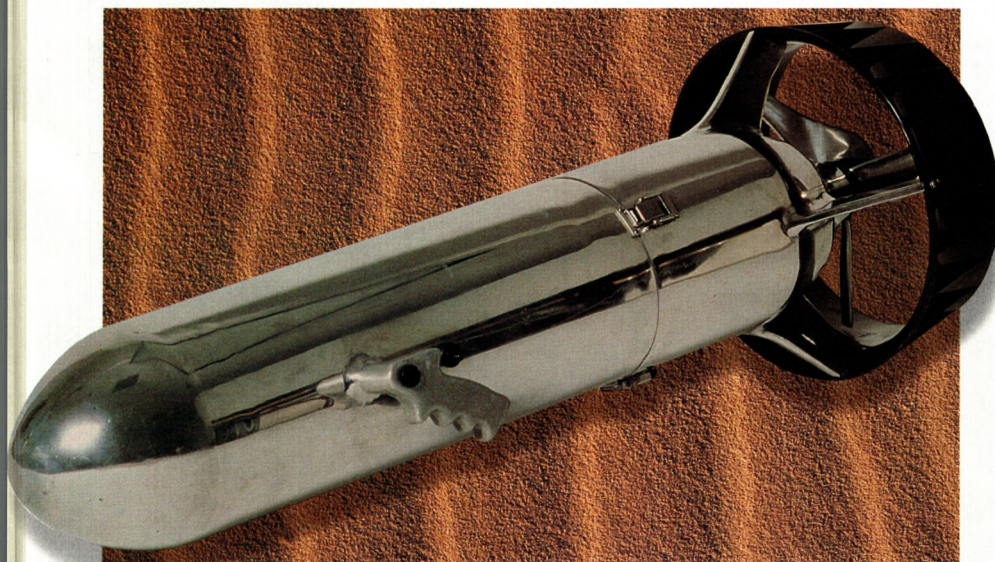
This level of performance has given Jackson's design nearly instant acceptance within the technical community, but it has also caused some interest among the general diving population. He says that of the 70 some units sold so far, several have gone to recreational divers who were attracted by the rugged design and reliable performance.

There is no magic to the Retro's performance, Jackson says. It is simply a matter of combining the most reliable, rugged parts available, pains takingly hand-assembling them like a fine custom car, and thoroughly water testing each model.

With an average retail price nearly twice that of some recreational DPVs (around \$2,700), the Retro probably won't corner the market. But divers who require rugged, reliable performance from a DPV are willing to pay the price, and are making the Retro the new standard for high-end DPV performance.

For information on the Retro DPV, write to American Underwater Vehicles, 7825 Jackson River Road, Leesburg, FL 34788. Phone (904) 669-5483, fax 669-1256. West Coast inquiries can be directed to Kevin Richardson at 909-823-2753.

What started as favors to friends soon turned into a major sideline. Even the U.S. Navy was sending Jackson their military Teknas for rebuilds.



Medical Sea Pak

Medical kits are an important piece of dive gear — especially for instructors and dive boat operators. Medical Sea Pak makes it easy to be prepared for most emergencies with first aid kits designed specifically for use in wet environments.



There are four different kits available: the Day Pak, Excursion Pak, Coastal Cruising Pak and Trans-Ocean Pak. Selection should be based on the amount of supplies you need and proximity to other medical assistance.

Kits are packaged in waterproof and mildew-resistant nylon and accompanying instruction manuals are printed on waterproof Tyvek. Numbered and problem-labelled mini kits

correspond to chapters in the instruction manual.

A mini kit is designated for prescription drugs and personal medications. Also, a color-coded pad assists with inventory control and keeping the kit stocked.

For information on the Medical Sea Pak dealer nearest you, call (800) 832-6054.

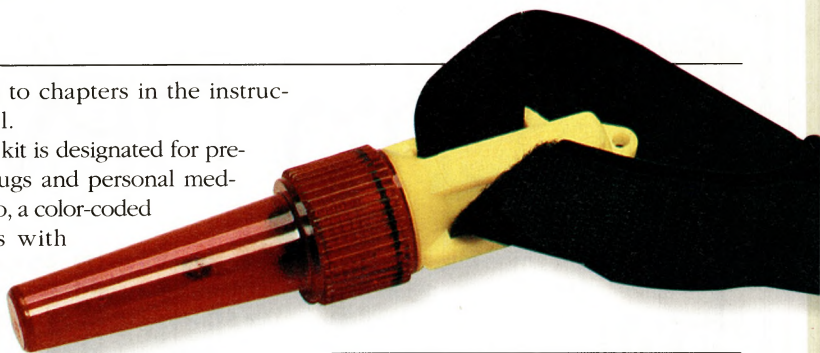
Tektite Mark-Lite Fire Fly

Now there's another alternative available to nightdivers. Instead of purchasing a chemical light stick that you'll throw away after a single use, try the new Fire Fly.

Manufactured by Tektite, the Fire Fly uses five flashing LEDs to mark a divers position in the water. Best of all, the LEDs will operate for 100 hours on a single set of two "N"-size batteries. "N" batteries are the same size used in cameras.

Available in red, the Fire Fly has a maximum depth rating of 1,000 feet. Also included is an adjustable velcro strap.

For more information on the Fire Fly or the Tektite dealer nearest you, call (609) 581-2116 or fax (609) 581-2488.



Flexo Hose Covers

Regulator and inflator hoses can be nicked and abraded if not protected. Techflex offers an alternative to hard plastic hose wraps.

Made from PET recyclable plastic, Flexo offers several advantages. It slips easily onto your hose for simple installation. Yet, it doesn't wear down like other hose protectors and is UV light resistant.

The hose cover dries quickly by allowing moisture to escape rather than trapping it. The braided design of the cover offers better cut and abrasion protection and washes out easily.

Flexo comes in a variety of colors to allow coordination with other gear or identification of special gas mixtures such as nitrox.

For more information on Flexo, contact Techflex at (800) 323-5140 or fax (201) 729-9320.



OCEAN GUIDE

PROFESSIONAL DIVE EQUIPMENT

**IS A NEW DIVE EQUIPMENT
MANUFACTURE THAT IS
DEDICATED TO PRODUCING
A HIGH QUALITY PRODUCT
SECOND TO NONE.**

- **BUOYANCY COMPENSATORS •**
- **REGULATORS • MASKS •**
- **SNORKELS • FINS • VESTS •**
- **DIVE SKINS • GLOVES • BOOTS •**

**FOR A FREE CATALOG OR
THE LOCATION OF A
DEALER NEAR YOU CALL
1-800-367-4459.**

(DEALER INQUIRES INVITED)

Free information circle 75 on reader service card

BECOME A PADI INSTRUCTOR

Instructor Development

Course Fee Includes:

- Lodging
- Transportation
- Tanks and Weight Belts

*Orlando Florida is an
International Travel Destination.
Join us for your Diving Career.*

KEITH MATTSON
Course Director 15561

FLORIDA DIVING INSTITUTE, INC.
a Division of **THE DIVE STATION**
★★★★★ PADI 5 STAR IDC
3465 Edgewater Drive
Orlando FL 32804
FAX (407) 849-1427

**FOR MORE INFORMATION
CALL US NOW**

1-800-282-3328

Free information circle 29 on reader service card



Train with
Tom Mount

**Demand
the best in
technical
education**

Benefit from 35 yrs of experience

- | | |
|--------------------------------------|--|
| 11,000+ LOGGED
DIVES INCLUDING: | AUTHOR OF
SEVERAL TEXTS
INCLUDING: |
| • 2300+ cave dives | • Safe Cave Diving, |
| • 1100+ wreck dives | • Practical Diving and |
| • 2200+ dives deeper
than 200 FSW | • Mixed Gas Diving |
| • experienced satura-
tion diver | |

Quality Diver Education

- | | |
|---|--------------------------------|
| • IANTD
Certification and
Instructor Training | • Technical Deep
Air |
| • Nitrox/
Advanced Nitrox/
Technical Nitrox | • Trimix |
| • Deep Air/ Advan-
ced Deep Air | • Cave |
| | • Wreck Penetration |
| | • Photography |
| | • Modeling with
Patti Mount |

1545 NE 104 St. Miami Shores, FL 33138 USA

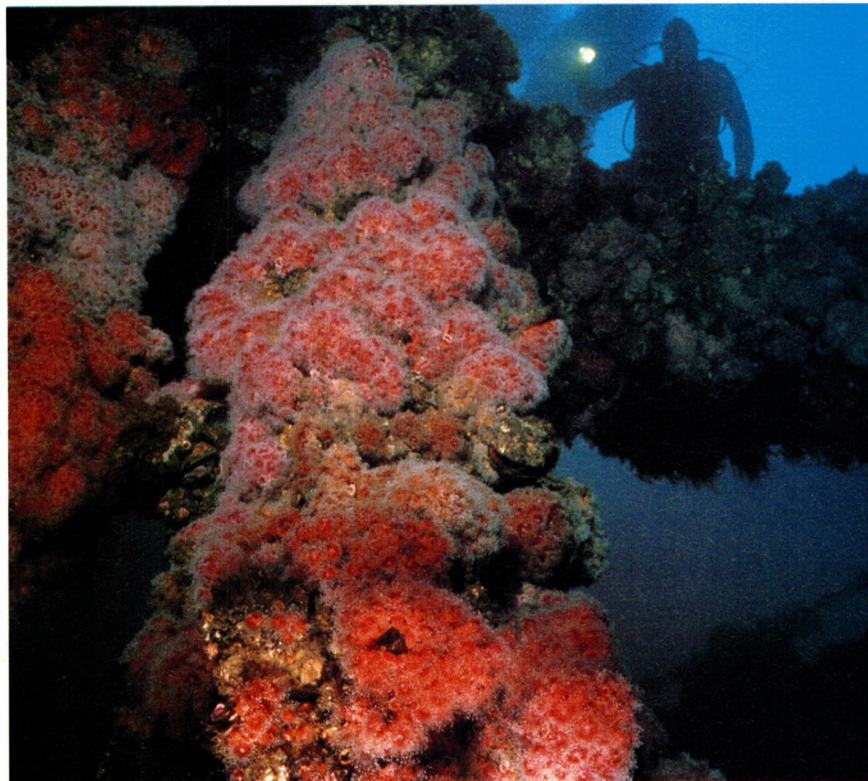
305-754-1027

Free information circle 54 on reader service card

ADVERTISING INDEX

ADVERTISER	PAGE		
Amphibico, Inc.	35	Florida Dive Institute	91
Aqua Nuts	84	Florida Keys Dive Center	98
Bahama Out Islands Promo Board	105	IANTD	85
Bare	25	IHK International	91
Beachaut	2,3	Indies Suites	35
Body Glove	17	JW Fishers Mfg., Inc.	88
Brac Reef Beach Resort	10	Kona Kai Resort	96
Bud 'n Mary's Dive Center	99	Mares	7
Bud Water Ski Tour	47	Marex Divers Inc.	103
Cayman Island Tourism	4	NAUI	31
Cheeca Lodge	94	Nitrox Tropical Divers of Kauai	84
Chesapeake Resort	83	Ocean Divers & Marina Del Mar Resort & Marina	100
D. Sea International	88	Ocean Waves	15
Deep Heet by Connelley	67	PADI	33
Dive Abaco Ltd.	104	Pelican Cove Resort & Lady Cyana Divers	96
Dive Dive Dive Ltd.	105	Pelican Landing Resort & Subtropic Dive Center	61
Dive Rite Mfg.	28	Porpoise Divers	85
		Quicksilver	22,23
		Quiescence Diving Services	99
		Red Sail Sports	13
		Roatan Charter Inc.	86
		Rob Shirley Custom Boats	18,19
		Scuba '94	98
		Scuba Pro	108
		Scuba Soft International	24
		Sea Vision USA, Inc.	11
		Stella Maris Resort Club	104
		Sunset Resorts	107
		Surfside Watersports	102
		Tom Mount Quality Diver	91
		Trimarine, Inc.	27
		Tropical Adventures Travel	80
		Tropical Adventures Travel	21
		Tusa	9, 29

D E S T I N A T I O N S



BRANDON COLE

Santa Barbara Oil Rigs

While considered eyesores for their above-water appearance, you'll be amazed by the beauty below. From invertebrates to pelagics, you can't beat the biological diversity.

B Y B R A N D O N C O L E

Hazel towered above, her massive metal form blotting out the sun, entrapping us in a cold black shadow. I can't even count the many nights I've seen her kind belch

flames high into the sky, burning off gases tapped from deep below. Nor the many times I've heard her species cursed as "eyesores" and "man-made monstrosities" that plague the idyllic

coastline of southern California. And what Santa Barbara native could ever forget the 1969 blowout of Platform A, where a quarter-million gallons of crude oil blackened beaches and killed numerous marine creatures?

But now, all looks quiet, gray, lifeless. My buddy signals to me, and into the water we go to dive the under structure of platform Hazel, one of the 30 oil rigs placed in the Santa Barbara Channel over the last 35 years to extract the area's rich offshore petroleum deposits.

What I see under the water's surface instantly amazes me. The heavy girder to my right is completely covered with brightly colored invertebrate life. Flashing fish dart all around me in clean, calm water. Shafts of sunlight lance downward, bouncing off crossbeams. The entire structure is breathing, pulsing with life.

Beneath the waves, the oil rigs are everything but the ugly and lifeless, hulking monsters above. Descriptions such as "the best artificial reefs around" and "aquariums without walls" hardly even begin to do them justice.

One could easily enjoy an entire dive spent at one depth, investigating a single beam for an hour. Then, there is also the vertical trip exploring top to bottom, encountering creatures common to the intertidal, the benthos and all depths in between. Having earlier decided to follow one of the large corner supports from the surface downward to the rig's base, I begin my survey of the encrusting marine creatures.

Acorn barnacles, untiringly straining the ocean currents for a drifting meal, span from the waterline to a depth of about five feet. Purple and orange ochre

The support structure of these oil rigs becomes a colorful habitat for a variety of creatures.

Hazel, Heidi and Hilda offer unique diving opportunities in the Santa Barbara Channel. But, unless you're diving on weekends when the rigs are not operating, you'll need special permission before you venture underwater. Situated in the 100-foot depth range, these structures allow an exciting mixture of reef, wall and blue-water diving. Make plans to see them soon, however, as two of the rigs are not in use and are scheduled for dismantling as early as 1995.

DESTINATIONS

stars are busy feeding among them, their second stomachs everted to digest through the barnacle's protective armor. Toward the center of the jungle gym, my buddy Jim floats mid-water, dwarfed by the massive bulk of Hazel's supporting undercarriage.

At 15 feet, the horizontal braces are overgrown with clumps of giant *Mytilus* mussels. Only their orange lips are visible, for the ebony shells of each mussel are totally covered with vibrant club-tipped sea anemones. Each grouping of these strawberry anemones differ genetically, and their colors vary from red to orange, pink to purple. What results is a beautiful multi-hued quilt which Hazel wears down to about 30 feet.

Kelp bass, surfperch, and half-moons, all reef fish common to the kelp beds of southern California, cruise among the girders and circle the pilings. I also find feathery hydroids, gray moon and macaroni sponges, and a handful of different nudibranchs. Momentarily stopping my descent at 40 feet to swim horizontally along a diagonal reinforcement, I come across a fat, well-camouflaged cabezon. It waits patiently, ready to ambush some hapless unsuspecting fish.

After 50 feet, the character of the reef changes again. Starting at about 75 feet, ghostly white plumose anemones, giants among their kin, sway back and forth gently. Although common farther north in the cold waters of the Pacific Northwest, *Metridium senile* are a rare and breathtaking sight for the southern California diver.

Touching down onto our knees at 100 feet, my buddy and I gaze out over the flat, sandy bottom stretching away in all directions. The oil rigs truly are oases of life in the otherwise barren desert of the Santa Barbara Channel.

At the center of the platform's base is a huge pile of debris composed mainly of mussel shells. Many-armed sunflower sea stars and spiny lobster prowl about the heap. Nearby, we spot the outlines of an angel shark and a halibut buried just under the sand.

For our ascent, we elect to remain on the inside of the structure. It gives one an entirely different perspective, with the platform's legs angling inward, looming menacingly overhead, coming together near the bright spot of the sun.

At about 40 feet from the end of our elevator ride, the two of us are enveloped in a swirling school of thousands of jack mackerel, *Trachurus sym-*

metricus. Seeming to flow almost like a stream of liquid mercury, they move as one, winding and slithering like some giant silvery snake through the labyrinth of steel beams. Completely transfixed, we float motionless for five minutes before resuming our upward journey.

Back on board, we shed our gear and grab a bite to eat before launching into an excited account of our dive to Janice Daily of Pacific Diving Adventures. PDA specializes in affordable two-tank, half-day boat trips out to the oil rigs, catering to small groups of four divers per trip. They usually visit the shallowest three platforms — Hazel, Hilda, and Heidi — off Summerland, just south of Santa Barbara. Two to three miles off shore, Daily picks these three as really the only rigs of the 30 on which "one can dive top to bottom safely". The first two sit in about 100 feet, the third in 130. The diving on each is a bit different, both structurally and biologically.

All of the rigs support diverse communities of fish, invertebrates and plants. The water-borne larval forms of many invertebrates settle onto the metal surfaces of the platform's understructure and develop into their adult forms. Bare steel is rapidly converted into a

with the organisms tied to each other in a complex food web. With respect to the fish alone, scientists have found 20 to 50 times more fish near and/or under the platforms than in nearby barren, soft-sand habitats.

Our in-depth discussion of the biology of these artificial reefs is interrupted as we are informed that it's time to motor on to our next dive site. Within minutes we are alongside platform Hilda and quickly jump into the water next to a huge corner support six feet in diameter.

A dense shag carpet of purple-tipped aggregating anemones obscures the metal underneath. In fact, one would be hard pressed to find a bare spot anywhere on the platform, so thick is the life, so intense the invertebrate competition for attachment space. We find a hermit crab scuttling over the arm of a knobby star presently gorging on the soft insides of a mussel. Feather duster worms, brittle stars, sea cucumbers, urchins, rock scallops and a giant key-hole limpet are mixed in among the mussels and anemones.

Hilda also has a healthy stand of giant kelp growing from a thick cross-beam in 15 feet of water. Squadrons of kelp bass and señoritas hover nearby. Searching with a keener eye, painted



thriving reef. Without such a hard substrate for attachment (and the rigs are pretty much the only things around) many of the larvae would die. Juvenile fish wandering about the open ocean congregate here because of the food, shelter and breeding grounds these structures provide.

All levels of the food chain (plants, small and large fish, invertebrates, marine mammals, birds and even large pelagics) are represented below the rigs,

greenlings and black eyed gobies are revealed. Then a bright, nearly fluorescent orange garibaldi, *Hypsypops rubicundis*, appears from behind a piling. It proceeds to lead me about in circles for the next ten minutes as I try, unsuccessfully, to photograph this usually cooperative fish. A flash of the same brilliant orange, but this time with a sprinkling of iridescent blue, stops my pursuit — a juvenile garibaldi, hiding between two closely situated supports!

DESTINATIONS

I shouldn't have been surprised to see them here. It's just another example of the mysterious, magnetic, critter-attracting properties of the oil rigs. In fact, Janice would later tell us of lucky encounters with ocean sunfish, blue sharks, barracuda, pelagic jellyfish and the like, all while diving on the platforms.

We next spot a small school of yellowtail out away from Hilda and swim out towards them. It really is an exciting experience to be able to do a little blue-

water diving as well as reef and wall exploration, all on one dive! On our way back up a California sea lion, *Zalophus californianus*, silhouetted against the bright water above performs a series of graceful pirouettes before disappearing out of sight.

Nearly any diver of any skill level can enjoy diving the off-shore oil platforms out of Santa Barbara. There's something for everyone — wall diving for the vertical enthusiast, colorful reefs teeming with life for those who

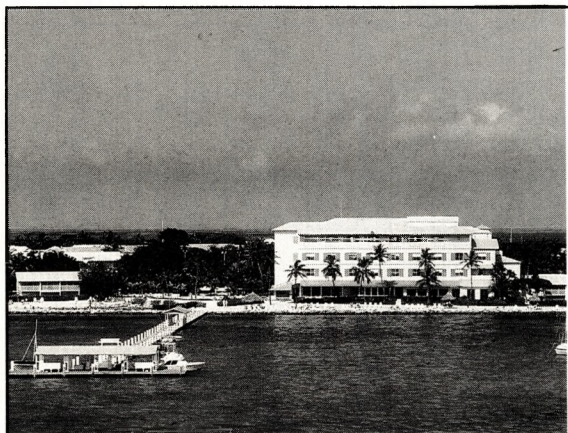
wish to examine things close-up, even encounters with marine mammals and pelagics.

Wreck divers should find the intricate structure of supports and machinery interesting, and spear fishermen might get a good size halibut on the bottom. Photographers are certain to have fun blazing through film. From colorful macro photography to the dramatic wide angle or video possibilities, the rigs' unique structure and prolific marine life ensure plenty of great photographic opportunities. And just think about a night dive on the rigs, with a totally different cast of creatures out and about under the cover of darkness!

The easiest way to enjoy diving the oil platforms safely and hassle-free is with Pacific Diving Adventures. Those with a boat can venture out on their own, but there are a couple of things to remember. First of all, unless one has special permission from Exxon, all diving should be done on weekends only, when the rigs are shut down and divers won't be interfering with drilling operations. Second, anchoring right next to the structure, or tying up to the rig is prohibited — a live boat is best.

And last, dive the rigs as soon as you can! They might not be around forever. Hilda and Hazel are currently non-operational and scheduled to be removed perhaps as early as 1995. Federal law mandates that dry, non-producing rigs be disassembled, both for aesthetic reasons and for purposes of navigational safety. The other rigs, and the thriving marine communities associated with them, are likely to face a similar extinction in the years to come.

Sadly enough the other option to removal, preservation, is unlikely to be exercised. In the Gulf of Mexico, numerous dry rigs have been converted into artificial reef marine preserves in the "Rigs to Reefs" program. This program has enjoyed great popularity with both diving and sport fishing industries. Such a program would most likely work in California too. There are interest groups fighting for the conservation of these unique habitats, but they are up against some very powerful opposition. ▀



Cheeca Lodge

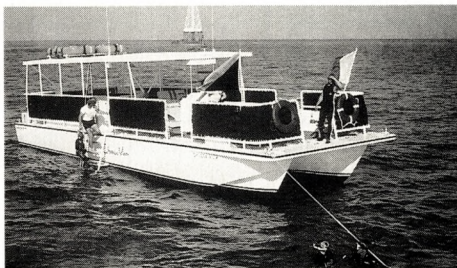
- 203 beautifully appointed rooms & suites
- 1,100' palm-lined beach
- Award-winning restaurants and lounge
- Lighted tennis courts
- Two swimming pools, saltwater lagoon
- Complete watersports facilities
- On-site dive center
- Charter fishing & diving trips
- Camp Cheeca for kids 6-12
- 525' fishing pier
- Par-3, nine-hole golf course
- Complete meeting facilities



- Eagle Wreck
- Alligator Reef
- Snorkel Trips Daily
- Night Dives
- Underwater Photography
- PADI Instruction

Cheeca Divers

The most comprehensive and service-oriented operation in the Florida Keys!



The "Cheeca View"

Mile Marker 82, Islamorada, Florida Keys 33036

Call (800)327-2888 or (800)934-8377

Dive the Purple Isle!

**Room rates as low as
\$175 per night***

**2-tank dive: \$39.95
(2-trip minimum)**

**Complimentary tanks,
weights, sodas & fruit**

***through May 2, 1994**

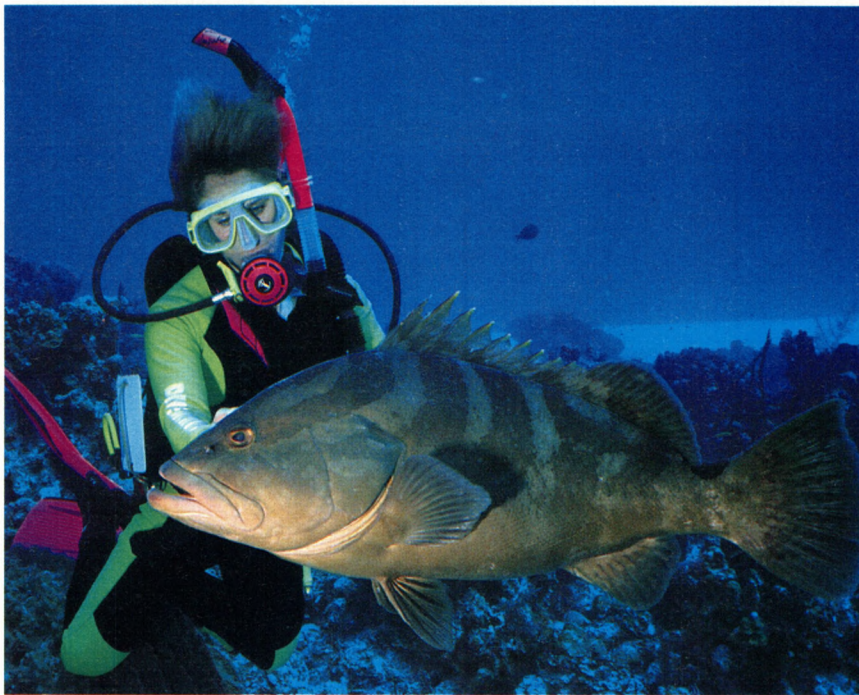
May 2-Dec. 19: \$99

(based on availability)



Contact Info

**Janice Daily, Pacific Diving Adventures
(805) 962-1771.**



PAT CANOVA

San Salvador, Bahamas

This small Caribbean island of white-sand beaches is surrounded by waters of incredible blues and aquamarines and offers tropical wall diving at its finest.

B Y P A T C A N O V A

As the first "tourist" to hit San Salvador and the New World, Christopher Columbus sought gold and untold riches when he accidentally set foot on the pristine shores of this tiny Bahamian island over 500 years ago. Finding nothing of value, Columbus and time moved on and the sleepy little island remained virtually unchanged for centuries.

Enter the second European invasion of San Salvador. And did they ever find "riches." Not gold of course, but an underwater paradise of sheer walls cut with canyons and gullies; all intricately coated with corals and colorful sponges and populated with an amazing variety of marine animal life.

San Salvador is a small island, roughly 12 miles long by seven miles wide, sitting some 200 miles southeast of Nassau. Its surrounding waters are incredible shades of blue and aqua-

rine contrasting with the stark whiteness of tropical beaches.

A quiet island with a one-street town called Cockburn, San Salvador has long been the quiet secret of a lucky few divers. But with the construction of Club Med's new Columbus Isle property, diving access has increased dramatically.

And San Salvador offers tropical wall diving at its finest. In addition to the sheer joy of cruising out over abyssal drop-offs, there are trenches and huge gullies slashing through many of the walls.

Then there are caves in those walls filled with anemones, and chimneys in the caves leading up through the heart of the reef systems. And if all that isn't enough to get your adrenaline pumping, how about schools of hammerheads cruising by so close you can almost touch them?

There are 30 moored dive sites strung out mostly along the southwest side of the island — here are found the

sheerest and most dramatic walls, and also the best corals. Club Med installed concrete and stainless moorings with the help of the Riding Rock Inn, who for years had the only dive operation on the island. In fact, the nice thing about diving San Salvador is the dive sites aren't overloaded with boats and people.

Dr. Johns is probably one of the best sites on the island. It's a sheer drop starting at about 35 feet. There are big coral heads sticking up with tunnels passing through them. There are also tunnels in the wall at around the 100-foot depth. You can scoot through them and then rise up through chimneys back to the top of the reef.

Another great site is Double Caves adjacent to Dr. Johns. Here you'll find two beautiful caves filled with white anemones. An entrance can be made just over the lip of the wall, with the exit on the face of the wall at about 110 feet. Turn around and everywhere you look the wall face is literally coated with huge plate corals, deepwater gorgonians, black corals, and antler sponges.

Grouper Gully features a couple of very tame groupers that apparently love divers. As you start your descent you can see them hovering down near the bottom, just waiting like anxious little puppies for the divers to come down and play with them. Even jaded divers used to everything still get a kick out of running their fingers down the silky smooth side of a wild creature who just as much seems to enjoy the interaction with them.

Along the tops of the walls and in shallower areas are some massive stands of pillar coral, their tall spires covered with hundreds of thousands of coral polyps waving the gently rocking rhythm of the water. Here also can be found such creatures as the brilliantly colored but shy queen angelfish whose antics include playing hide and seek among the coral with impatient underwater photographers.

North Pole Caves is a newly designated dive site featuring a huge crack in the wall. Descending down into the crack, you run into a big cave with little chutes digging into the wall itself. It's a massive cave with exits at both the 80- and 130-foot levels. Incredible amounts of schooling snappers and goatfish swirl in a concentrated mass just above the entrance of the cave.

An incredible dive is the Great Cut

San Salvador offers dive sites and marine encounters even jaded travellers will enjoy.

DESTINATIONS

where a portion of the wall cracked off and slid down creating a big gorge and leaving a coral island shot through with two huge tunnels. The bottom of the gorge is about 100 feet and coral has grown from the island to the main wall creating bridges you can swim underneath.

Telephone Pole is a sand bottom at 30 to 35 feet that slopes down to the coral which builds up to maybe 30 feet and then drops over the wall. The quantity of life on this wall is just amazing. There is a hole in the wall at 45 feet that winds its way through the wall itself with light filtering down through the corals, and lets you out at about the 80 foot level.

Along the south point of the island is where the big schools of hammerheads hang out, especially during the winter months. "Last season we had a lot of hammerheads," says Club Med scuba instructor Billy Stein, "We were running into schools of 40 or 50 of them. The water was a lot colder then which brings them back up to the shallower water. January, February or March is the best time to see them."

Allowing that the winter conditions are easier for the more experienced

diver, Stein says an encounter with the hammerheads is not for the fainthearted, "A lot of divers get scared and nervous because they do come really close, 10 or 15 feet away, especially when there are about 25 or 30 of them cruising by. But we've never had a problem with them actually approaching a diver in an aggressive manner."

In addition to the hammerheads and tame groupers, many sightings are made of manta rays, pilot whales and eagle rays as well as tiger sharks, nurse sharks, reef sharks and turtles.

Something that might interest divers searching for new experiences is kayak diving, a specialty course offered by Club Med. Instruction is given in kayak handling and then an expedition is undertaken to one of several designated dive moorings.

Kayak diving is definitely a challenge, especially learning the nuances of balancing yourself, your buddy and two sets of scuba gear in a craft the size of an overgrown telephone pole. The sense of freedom and independence, though, makes all the effort worthwhile.

Incredible as the diving is at San Sal, what's even more interesting is that only

about half or even less of the island has been dived. Club Med expects to do much more exploration diving soon, seeking those virgin dive sites around the other side of the island. All day, three-



BRENDA WEAVER

tank excursions circumnavigating the island are planned for the near future.

If you want exquisite wall diving and first-rate facilities, don't want to travel too far, like 150- to 200-foot visibility and crave international flavor then you have no further to go than San Salvador. Take it from Columbus, he would have loved his namesake Isle.

The Center for Wreck and Reef Diving in the Florida Keys

DIVE WITH...



LADY CYANA DIVERS

Come explore ... miles of magnificent reefs at one of the most accommodating dive facilities in the Florida Keys

Featuring... 60', 40' and 26' Dive Boats
• Instructional Staff and Dive Classes
• Pro Shop • Underwater Photo Center
• Dive Packages • Rental Equipment

Mile Marker 85.9, U.S. 1
P.O. Box 1157 • Islamorada, FL 33036
(305) 664-8717 • (800) 221-8717

STAY WITH...



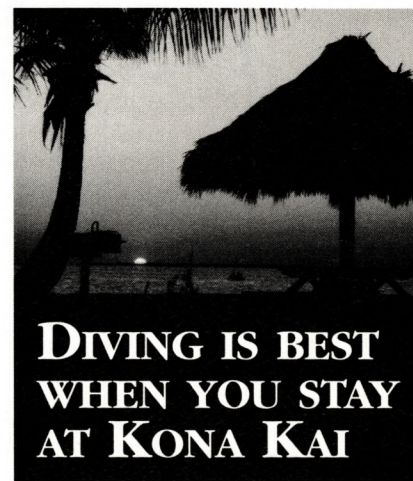
The Key's most relaxing waterfront resort

Oceanfront Rooms,
Efficiencies and Suites
• Pool and Jacuzzi • Private Beach
• Boat Ramp and Dockage
• Tennis • Watersports
• Poolside Cabana Bar and Cafe
Fishing Charters also available



Pelican Cove Resort

M.M. 84.5, Oceanside • Islamorada, FL 33036
(305) 664-4435 • (800) 445-4690
FAX (305) 664-5134



DIVING IS BEST WHEN YOU STAY AT KONA KAI

Florida bayfront • Heated pool and spa • Tennis, basketball, shuffleboard, horseshoes • Sport boats, boat ramp and dockage • Dive packages • Dive lockers and rinse tanks • Tikis and BBQs • Fishing and swimming from our private pier • Magnificent sunsets

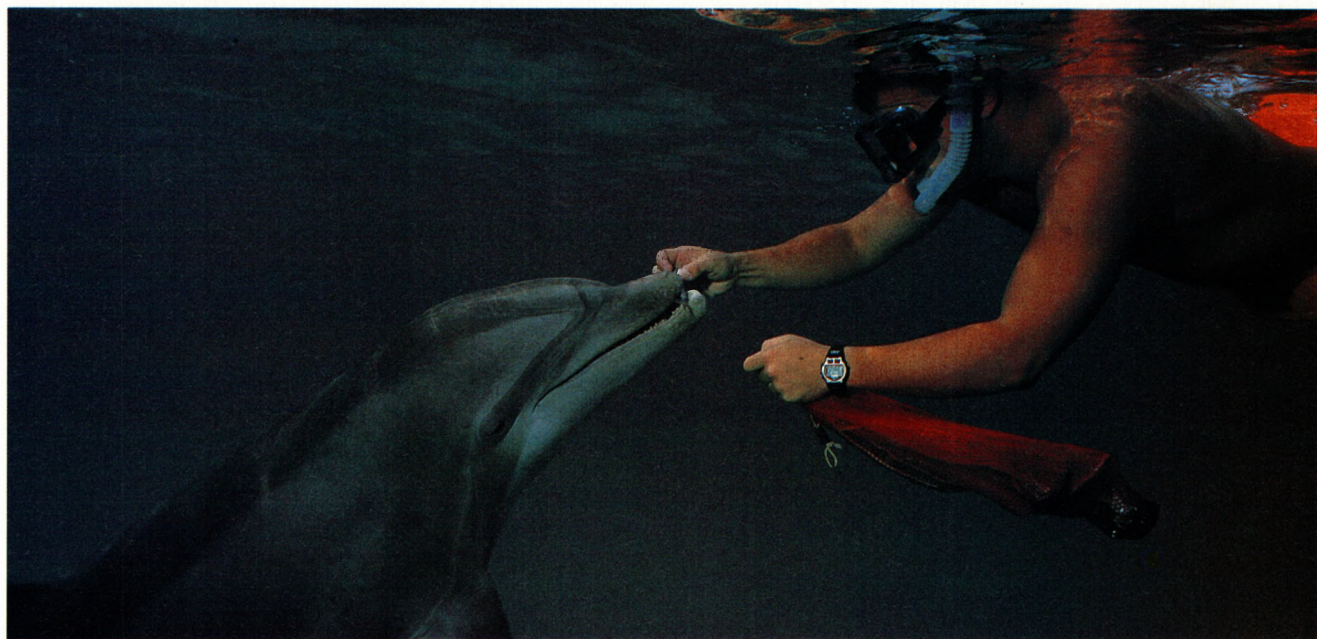


KONA KAI RESORT
97802 S. Overseas Highway
Key Largo, Florida 33037
1-305-852-7200 or
1-800-365-STAY

THE LITTLE RESORT IN THE HEART OF
AMERICA'S TROPICAL PARADISE

Free information circle 31 on reader service card

Free information circle 20 on reader service card



RICK HEYDEL

Panama City, Florida

Sugar-white beaches, warm water and great wreck sites make this Gulf Coast area a great place to visit for training and recreational diving.

B Y V I N C E R H O D E S

The pavement glided away beneath me. The only thing missing was the hum of car tires. But there'd be no sounds of gridlock here. I wasn't travelling to my destination, I was already diving — swimming through a portion of the Hathaway Bridge spans located near Panama City, Florida.

Urchins and starfish, not cans and papers, littered the road below. Hundreds of fish swirled slowly around the bubbles escaping from the exhaust port of my regulator, huddling so tightly together that they blocked out any light from the surface. It was like making a night dive during the day.

I shone my light upwards and the fish scattered, allowing a shaft of sunlight to briefly illuminate the superstructure towering above me. I turned just in time to see a grin as large as my own on the face of my buddy. I stopped to clear my mask — water had seeped in along my smile lines. It cleared just in time for me to see two silvery jacks speed by the

nearest girder.

Getting an OK from my buddy, we continued along the span. This wasn't a typical wreck or reef dive, but with 50 foot visibility and 80 degree F water temperatures, we were enjoying it just the same.

Actually, there's very little that's typ-

ical about diving the Gulf Coast of Northern Florida. We found two excellent dive centers to give us a sample of the best Panama City diving has to offer — Hydrospace Dive Shop and Panama City Dive Center (PCDC).

Hydrospace offers two full-service locations and a total of six dive boats ranging from 48 to 65 feet in length. Referral dives for most training agencies as well as classes and resort courses are available. Trips leave from the dock right behind the shop minimizing the distance gear has to be toted. A friendly, enthusiastic staff is ready to help you board the boats, but you'll want to reserve your spot well in advance. During peak summer months, space can be limited.

Hydrospace general manager Scott Donaldson explains that Panama City's location in the panhandle of Florida makes it a shorter trip than the Keys.



BRENDA WEAVER

"We're located close enough that instructors bring their students here for training. The students feel comfortable enough to come back." If you want to avoid the training crowds, Donaldson recommends you visit on a weekday.

Once aboard one of the boats, divers get a brief introduction to the boat, crew and Panama City diving. Democracy (or the loudest voices, at least) rules. The boat captains may make some suggestions, but the passengers make the final decision. This excursion would take us to the *Chippewa* and a Liberty ship.

As the *Reef Runner* raced away from the dock, I couldn't help but notice the sugar-white beaches. It's quite a sight if you're used to the typical yellow-brown sand common to much of the East Coast.

The *Chippewa* rests upright in about 96 feet of water and as we approached, milky white sea anemones and greyish sea cucumbers seemed to grow from the hull of the wreck. Schools of jacks circled. Dropping over the side of the wreck, we headed for the sandy bottom where I found a shell-seekers dream — queen helmet shells, butter plate sized sand dollars and urchins lay scattered

about the sand.

While I scoured the ocean floor, my buddy took the opportunity to spearfish. In fact, several divers aboard the *Reef Runner* carried spearguns in hopes of catching one of the many grouper or jacks.

But even the lure of potential targets and sea shells couldn't keep us from giving the wreck a closer look. We glided past railings and decks until we came to an open door. Swimming through, we followed a staircase up into a large room that probably had served as the wheelhouse. Although we made only a minor penetration through a side door, open cargo holds and hatches beckoned for exploration by trained wreck divers.

All too quickly, we headed for the surface. Regardless of having a computer, we were asked to be back from our 90-foot dive in 20 minutes.

Our ride to the next site took under an hour and we quickly prepared for our exploration of the Liberty ship. At a depth of 71 feet, the wreck, which was cut at the waterline, offers much of the same marine life as our first dive, along with the occasional sea turtle and manta ray. With less structure to examine and more of a current to contend with, this

21 minute dive wasn't quite as enjoyable as our experience on the *Chippewa*. However, great visibility and warm temperatures requiring only a shorty wetsuit were enough to make this a fun and worthwhile dive.

Both Hydrospace and PCDC offer a variety of trips — six hour excursions to wreck sites like the *Chippewa* and *Tarpon*, four hour jaunts to the *U.S.S. Strength* and the Hathaway Bridge spans, and an eight hour trip to the *Empire Mica*.

The water is warmest during the summer — generally June through September. According to Kevin Youd of PCDC, you generally don't need a wet suit and there's a better chance to find a boat going out for dives since there are more divers in the area. If spearfishing and avoiding crowds is more your style, he advises you visit during the winter months. The water temperature drops to the 50s, but the visibility improves.

NAUI referrals, private lessons and resort courses are available from PCDC. And, says co-owner Mike Gomez, the facility will soon offer Nitrox.

The PCDC fleet includes two 48 foot converted crew boats, two 38 foot fiberglass custom boats, and a few six pack

ENJOY KEYS LUXURY

EXPERIENCE THE BEST OF BOTH WORLDS

PENNEKAMP PARK TO ALLIGATOR REEF

Fulfill your vacation fantasy both above and below the water with the finest accommodations and most complete PADI 5-STAR Training Center and Dive Resort the Keys have to offer.

"IT DOESN'T COST MUCH MORE TO GO FIRST CLASS."



- 3 COAST GUARD CERTIFIED BOATS
- EASY DIVE ACCESS
- ALL LEVELS OF PADI INSTRUCTION
- 2 DAY ADVANCE & REEF ECOLOGY COURSES



CALL FOR
SPECIAL RATES

1-800-433-8936 (ext.9)
(305) 852-4599

"Still the Best Kept Secret" P.O. BOX 391 • PLANTATION KEY, FLORIDA 33070



- ONE & TWO BEDROOM SUITES
- COMPLETE KITCHENS
- POOL - BEACH - LOUNGE
- MUCH MUCH MORE



THE WORLD'S LARGEST DIVE BOAT BUT ONLY FOR 3 DAYS!



SCUBA '94

The Dive Show

June 24-26, 1994

aboard the Queen Mary, Long Beach, CA
THE LARGEST CONSUMER DIVE SHOW IN THE WESTERN U.S.

50,000 square feet of exhibits
Continuous Film Festival • Seminars

THE DIVING EVENT OF THE YEAR!

For information call (310) 792-2333 • St. Brendan Corp.

Free information circle 13 on reader service card

DESTINATIONS

boats. Group sizes range from four to 18 people per boat depending on the day and time of the year.

Our six pack boat carried a cozy group of four toward our destinations — the *U.S.S. Strength* and the Hathaway Bridge span. A former tender to a navy mine sweeping fleet, this 184-foot wreck harbors enough fish, marine life and shells to interest any diver.

We stayed on the 76 foot wreck for about 35 minutes and then headed for the span. One advantage of the smaller boat was more flexibility with our dive profiles. Those having computers were free to plan according to their instruments rather than tables.

During the ride back to the dock, we noticed some unusual activity near a small boat. Closer examination found a woman interacting with a wild dolphin. The large silver-grey body stood high above the surface of the water so that the animal could almost look the passenger straight in the eye.

This dolphin friendliness allows many visitors to see these magnificent mammals up close. And both stores offer snorkeling trips and dolphin encounters.

Also, if you're not up for another boat ride, try the St. Andrews State Park jetties. A nominal admission fee gains you entrance to the park for the day. Dive the jetties and you'll find depths of up to 50 feet and plenty of fish and shells. In addition, if you're looking for a slight change of scenery after a few days of Gulf Coast diving, Panama City is about an hour from fresh water Cypress, Morrison and Vortex Springs.

Whether Panama City is your destination or a convenient stop while en route, the wrecks and artificial reefs that abound along the Gulf Coast are worth checking out.

Contact Info

Panama City Dive Center
4823 Thomas Drive
Panama City, FL 32408
(800) 832-DIVE; (904) 235-3390
Fax (904) 233-0624

Hydrospace Dive Shop
6422 W. Highway 98
Panama City Beach, FL 32407
(800) 874-3483; (904) 234-3063
or
3605-A Thomas Drive
Panama City Beach, FL 32408
(904) 234-9463

TIRED OF DIVING IN A CROWD?

Personalized Charters with. . .

Quiescence



DIVING SERVICES

Charters - Three boats; We limit 6 passengers per boat.

Instruction - O.W. classes, Referrals, DAN O₂ course, SSI Instructor Evaluation and Crossover courses.

PSI Tank Inspection program.

Hydros and Regulator Repairs

SSI * NAUI * PADI * YMCA

Quiescence Diving Services, Inc.
MM 103.5, P.O. Box 1570
Key Largo, FL 33037 * 305-451-2440

Free information circle 24 on reader service card

CHARTER SUBSCRIPTION

SPORT DIVER MAGAZINE
CALL NOW 800-394-6006

DIVE ISLAMORADA

Bud n' Mary's Dive Center

...the uncrowded Divers
retreat in the
Florida Keys.

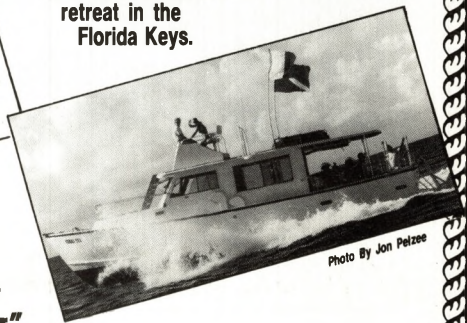


Photo By Jon Pelzee

**Dive from our 41' Glass
Bottom Customized Dive Boat
Dive the Eagle, "287' Freighter"
Dive the 1733 Spanish Fleet
Dive the reefs with the friendliest & best trained crew
Dive pkgs. available in our beachfront guest house.
Dive Training
PADI & NAUI**

Full Service Dive Store and Marina

M.M. 80 at Bud n' Mary's
P.O. Box 1126

Islamorada, FL 33036 • Local 305-664-2211 • FAX 305-664-5592

Discover the
San Pedro
Archaeological
State Park



800-344-7352



10 Reasons To Dive With



- ✓ Easy, Fast Access from Airport
- ✓ Most Complete Dive Resort in Fl. Keys
- ✓ State of the Art Dive Boats
- ✓ Best Variety of Dive Experiences
- ✓ Custom Dive Packages

DIVE THE DUANE AND BIBB



And Stay With



MARINA DEL MAR Resort and Marina

SEE CHRIST OF THE ABYSS

- ✓ In the Heart of Key Largo
- ✓ Adjacent to Ocean Divers
- ✓ Deluxe Accommodations
Standard Rooms to Suites
- ✓ Oversize Pool, Fitness Center,
Tennis Courts
- ✓ Coconuts Restaurant & Lounge

ESCAPE TO KEY LARGO PACKAGE 4 nights, 3 days of diving. Accommodations in a Deluxe Room, 1 two tank dive trip daily (tanks and weights included). Welcome cocktails at Coconuts, T-shirt, equipment storage, continental breakfast each morning, 10% off dining at Coconuts, 10% off lunch at Doc's Galley, and complimentary beverage at Gilligan's Dockside Bar.

\$369.00 PER PERSON BASED ON DOUBLE OCCUPANCY

Let Our Friendly Staff Assist You in Arranging the Best Dive Experience in the Florida Keys

Don't miss these terrific events!

May 20-22, 1994

- Coconuts Dolphin Tournament
- Marina Del Mar Resort & Marina
- \$17,000 Guaranteed Cash Prizes

May 27 & 28, 1994

- Ocean Divers/Mares Tent Event
- Sensational Buys & Bargains on Mares Dive equipment & other goodies
- Mile marker 102.5 on U.S. 1 in Key Largo

1-800-451-1113 ext.10

Ocean Divers
522 Caribbean Drive
Key Largo, FL 33037

OR

1-800-451-3483 ext.10

Marina Del Mar
527 Caribbean Drive
Key Largo, FL 33037

RESORT REPORT



VINCE RHODES

Surfside Watersports at Rum Point

B Y VINCE RHODES

Sometimes you just want to get away from it all — even the hustle and bustle of a resort area. If you're on Grand Cayman and Seven Mile Beach is just too busy for you, try Rum Point and the diving services of Surfside Watersports.

Island charm and a relaxed atmosphere are the hallmark of Grand Cayman's north end. A 30- to 45-minute ride from Seven Mile beach, this area is like a different island.

And best of all, you're closer to some of the best diving there is along the north wall. Boat trips are relatively short so you don't have to wake at the crack of dawn to board. And Surfside's location here allows divers to leave later than with other operators and still reach prime dive sites first.

Surfside Watersports at Rum Point is a small operation, but that's a benefit. You won't be crowded on the dive boat

and you have the advantage of developing a good rapport with the crew — you dive with the same staff members every day. The crew knows where you've been, your level of experience and what you want to see. After one day, it's like diving with old friends.

Another perk of diving with Surfside Watersports is their ability to provide any type of diving. If you're interested in diving more than just the north wall, Surfside's George Town location can take you elsewhere. Surfside also offers a "Two Island Package".

Diving and flights to Little Cayman are arranged by Surfside allowing you to experience the best Grand Cayman and Little Cayman have to offer for a single island price.

Accommodations on the north end aren't a problem either since Surfside can book lodging according to your needs. The Island Houses sit just across

the street from the dive shop and offer spacious townhouse charm with a view of the lagoon. The Retreat is located next to the dive store on Rum Point and offers some great ocean views and a sand/iron-shore beach. And soon to be reopened a little over a mile down the road, Cayman Kai Resort will offer comfortable sea lodges on the oceanfront.

Rent a car if you plan to stay on the north end. This gives you the flexibility to motor down to the public beach or head across the island toward Seven Mile Beach for a day of shopping and great restaurants. If you're not up for the drive back to town, there are a few restaurants on the north end.

The Kaibo Grill and the Rum Point Club (formerly Jud's) serve lunch and dinner. The selection isn't enormous, but the food is excellent and the Rum Point Club cooks a mean steak. But don't expect a dining room — it's all outdoor meals and picnic tables. But, with an ocean view, who needs a maitre d'?

Also, the bar and restaurant at Cayman Kai Resort have reopened. And a new restaurant and beach facilities will be built on Rum Point later this year which will be operated by the Hyatt. This progress will also bring a ferry connection of Rum Point to the Seven Mile Beach area.

With the construction of the new facilities, Surfside Watersports will move to a new full-service dive store to be constructed a mile away at Kaibo.

If getting away from it all is your goal, you need to be on the north end of Grand Cayman diving with Surfside Watersports. Their experienced and knowledgeable staff are waiting to provide a low-key dive vacation tailored to your specifications. 

More Information

Surfside Watersports

(800) 543-6828, fax (809) 949-8639

Grand Cayman



B

W

I

THE NORTHSIDE

Stay at one the most tranquil parts of the island. Unspoilt. Undeveloped Unbelievable. Dive, snorkel, play a game of tennis or just relax on over 400 acres of white sand. Walk a few feet from your choice of accommodations and our boats will take you to the famous 'Northwall' or Stingray City.



RUM POINT

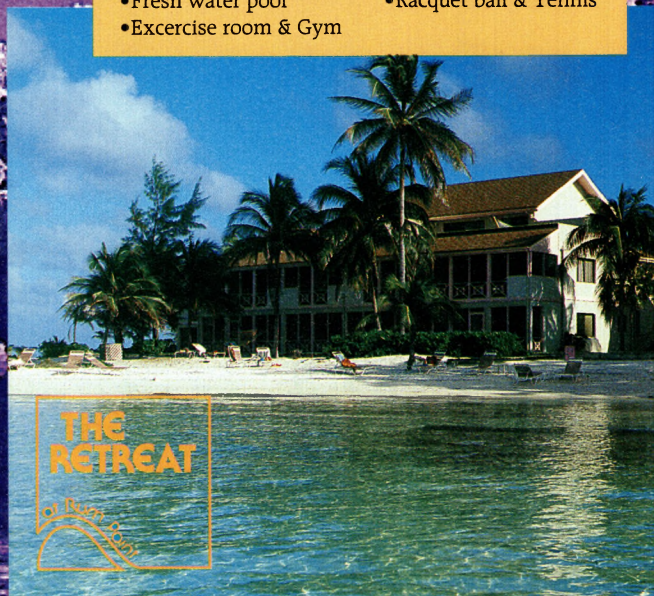
Surfside Watersports for the best diving & fun in Grand Cayman

- One of Cayman's oldest operations.
- Instruction.
- Experienced & friendly staff.
- Full diving facility.
- Day & night dives.

THE RETREAT

....for the discerning

- Luxury condominiums
- Fresh water pool
- Exercise room & Gym
- Beachfront
- Racquet ball & Tennis



CAYMAN KAI RESORT

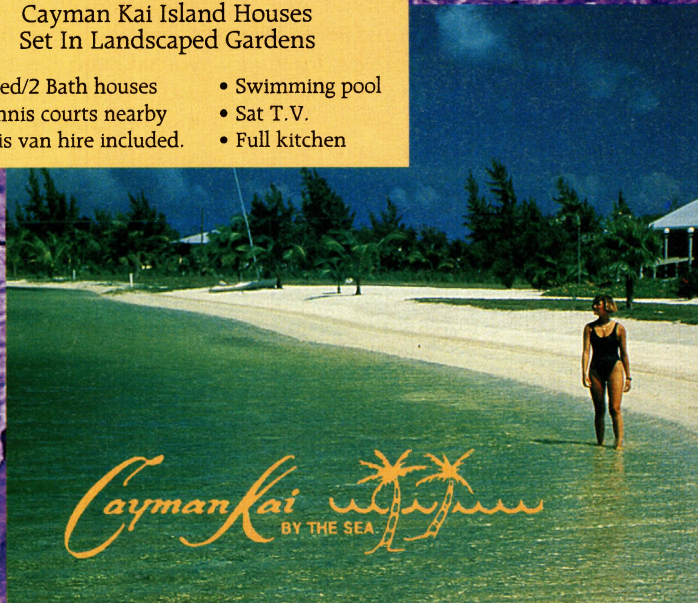
...Oceanfront sealodges

- Outside dining & bar
- Relax in a hammock, swim or just laze away the day.
- Snorkelling

CAYMAN KAI

Cayman Kai Island Houses
Set In Landscaped Gardens

- 2 Bed/2 Bath houses
- Tennis courts nearby
- Avis van hire included.
- Swimming pool
- Sat T.V.
- Full kitchen



TO BOOK YOUR "DIVE CAYMAN" VACATION PACKAGE CALL TOLL FREE
(800) 543 6828 OR (809) 949 7330 FAX 949 8639

TRAVEL & INDUSTRY

Mad Dog Expeditions Offers Adventure

Mad Dog Expeditions has scheduled 1994 dive adventures to the clear-water tributaries of the Amazon, the Arctic, the caves and freshwater systems of Northern Florida, and the caverns, caves and jungles of the Yucatan.

The group will also be offering highly individualized and flexible helicopter diving in Papua, New Guinea. Expeditions in 1995 will include excursions to Antarctica's Weddell Sea and underwater excavation sites in Israel.

For more information, contact Mad Dog Expeditions at (800) 4-MAD-DOG.

Wenoka Line Sold

On February 4, 1994 Wenoka Sea Style sold its product line, names, patents and trademarks to Sea Quest, Inc. and Deep See, Inc. Specific Wenoka Sea Style products have been designated for integration with either the Sea

Quest or Deep See product lines.

For further information, contact Sea Quest at 619-438-1101 or Deep See 206-435-6696.

Aquatic Encounters Travels To Aldabra Atoll

The Aldabra Atoll will be available to the scuba diving and snorkeling public for the first time ever when Aquatic Encounters hosts its "Expedition to Paradise" dive trip. The atoll is located in the Seychelle Islands group in the Indian Ocean, some 400 miles offshore from Tanzania and Mozambique on Africa's East Coast.

Costs for excursions are \$3,100 for the photo safari and approximately \$4,200 for the dive trip (costs depend on nature of accommodations chosen aboard the *Fantasea II*). Both prices are exclusive of airfare. For more information, contact Aquatic Encounters at (303) 494-8384 or fax (303) 494-1202.

PADI INTRODUCES TELEVISION PROGRAMMING HOTLINE

PADI International has created a round-the-clock hotline for viewers seeking air dates and times for *Today's Diver* on ESPN and ESPN2. Divers and non-divers interested in watching the 30 minute program can call (714) 540-7234 anytime and select extension "6" to hear the recorded programming information.

Additionally, PADI has become a sponsor of *Undersea Adventures*, a new recreational diving program airing nationally on the Travel Channel cable network. Programming information for *Undersea Adventures* will also be available on the programming hotline.

Dive With Sperm Whales

Underwater photographer Amos Nachoum will be co-sponsoring a trip August 8-19, 1994 to the Azores Islands off Portugal to dive with sperm whales that can reach lengths of 60 feet and

Dive For Treasure.

Spend six nights and five days in the Bahamas aboard the 100 foot, live-aboard dive boat the Palm Princes exploring the remains of the Nuestra Senora de las Maravillas, one of the richest Spanish Galleons ever to sink in the Western Hemisphere. Sift sugar-white sand for pieces of eight, un-cut Colombian emeralds and gold doubloons. Dive with wild dolphins. Witness the hand feeding of reef sharks with experienced underwater guides. For more information contact: Jerry Cox, 901-681-0100 or write:

Marex Divers, Inc.
5100 Poplar Ave, Suite 2208,
Memphis TN 38137

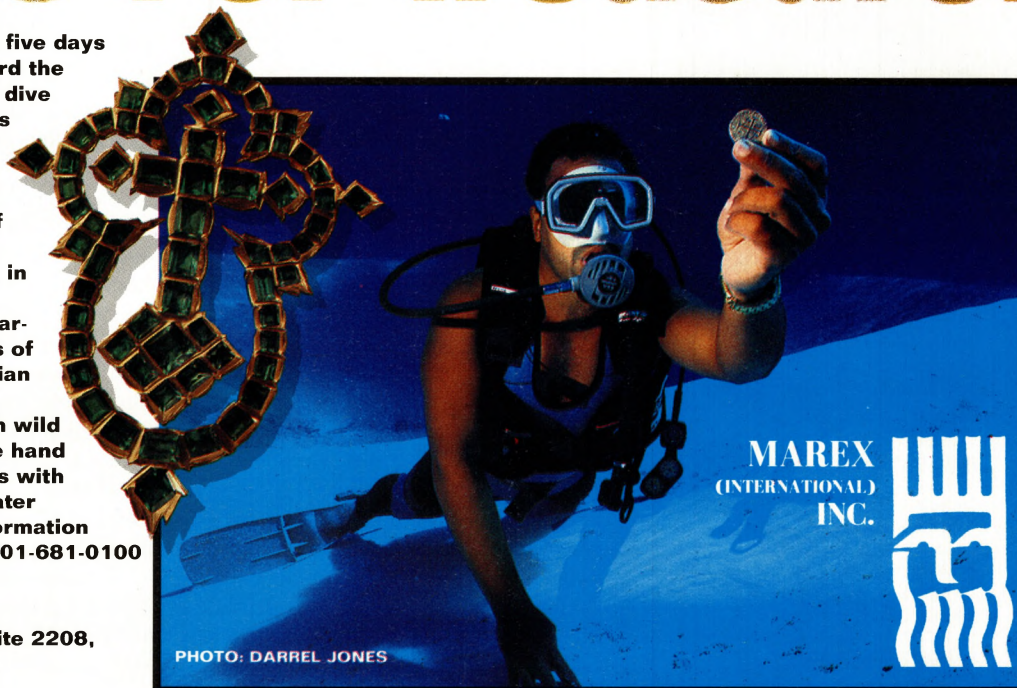


PHOTO: DARREL JONES

MAREX
(INTERNATIONAL)
INC.



Free information circle 80 on reader service card

Adventure In Diving

- *Shark Reef!*
- *Conception Wall!*
- *World's Deepest Blue Hole!*

... and now...

- *Treasure Diving!*

Only *Stella Maris* offers simply everything...

... to the adventure minded or the relaxed diver, even the beginner...

... in the luxury of an island which is unhurried, uncrowded, and unspoiled, above and under water.

Week's Packages

from: \$580.00 (acc / divg)

to: \$1399.00 (all incl w/ flights)

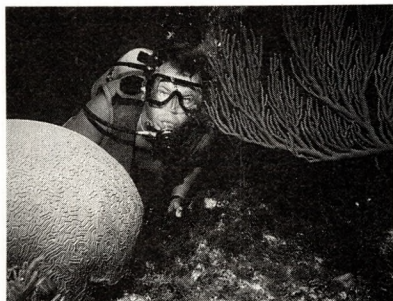
contact: 800-426-0466

Stella Maris

Southern Bahamas

Free information circle 72 on reader service card

DIVE ABACO



Join us on board our specially designed dive boat and explore tunnels and caverns in majestic coral mountains rising from a depth of sixty feet to the ocean surface in clear turquoise waters.

- Scuba and snorkeling trips daily
- NAUI & PADI certified instructors offering resort (beginner) courses or full certification courses—we also do referrals
- Underwater videos
- Dive/Hotel/Air packages available

DIVE ABACO

P.O. Box AB20555
Marsh Harbour, Abaco, Bahamas
(800) 247-5338 (U.S. & Canada)
(809) 367-2787 (Marsh Harbour)
(809) 367-4004 (FAX)

Free information circle 74 on reader service card
104 SPORT DIVER

TRAVEL & INDUSTRY

weights over 40 tons.

The 11 night live-aboard excursion will take place on the 68 foot *Colomban*. The cost is \$2,850 and does not include round-trip airfare to Portugal. For more information, contact Tropical Adventures Travel at (800) 247-3483 or Amos Nachoum at (415) 388-7979.

1993 NOGI Awards Given

The Academy of Underwater Arts and Sciences has announced the 1993 winners of the prestigious NOGI award. The Academy was founded to further exploration and study of the underwater world.

Howard Hall received the award for Excellence in Underwater Arts for his photography and videography. Jean-Michel Cousteau received the award for Excellence in Underwater Science for fostering an increased awareness of the need to preserve our oceans.

Dive instructor John Christopher Fine received the award for Excellence in the Advancement of Underwater Sports/Education. And, the governor of Connecticut, Lowell P. Wicker Jr., received the award for Excellence in Distinguished Service for the Promotion and Advancements in the Underwater Fields of Endeavor for his active support of marine research programs in congress.

NOGI stands for New Orleans Grand Isle and was originally an award for spearfishing before the Academy adopted the honor for it's Fellows.

YMCA Search & Recovery Manual Released

The YMCA Scuba Program has released a newly revised search & recovery manual. It is written to provide much needed information to emergency squads, fire companies, civil defense units and police departments involved in recovery/rescue diving.

The manual costs \$25 and is available from the YMCA National Scuba Program, 5825-2A Live Oak Parkway, Norcross, GA 30093-1728. Phone (404) 662-5172 or fax (404) 242-9059.

PPR 1994 Family Weeks

Palau Pacific Resort and it's dive operation Splash are welcoming families to their resort on two exclusive 8-night trips this summer. On these special family weeks, a teacher/escort will organize kid's activities such as water-sports and beach games, plus historical

and cultural outings to deserted islands, WWII wrecks, taro plantations, crocodile farms, and much more.

Scheduled 1994 dates are: June 18-28 and June 26-July 6. These dates include travel time from the US. Prices range from \$4,700-\$5,876 based on a family of four.

For more information contact Ras-cals in Paradise at 650 Fifth Street Suite 505, San Francisco, CA 94107. Phone (415) 978-9800 or (800) U-RASCAL or fax (415) 442-0289.

DeMag Lens & Professional Plan

SeaVision has introduced a demagnification lens that corrects for the enlarging properties of water. The DeMag is available, like other SeaVision products, with or without the color correcting filter system.

If you are a dive professional, you can experience SeaVision products for less than you think. The Professional Purchase Plan is SeaVision's commitment to ensure everyone who makes their living in the dive industry has an opportunity to improve their vision.

For more information, contact Sea Vision at (800) 732-6275 or fax (813) 525-8074.

DEMA Office Moves

As of February 24, 1994, the Diving Equipment Manufacturers Association office moved to a new location. Please direct all future communications to the new address: DEMA, 27071 Cabot Road, Suite 103, Laguna Hills, CA 92653. Phone (714) 348-7780 or fax (714) 348-7784.

Reef Balls Artificial Reefs

The Reef Ball Development Group has created a mold system to build attractive artificial reef modules. These Reef Balls can be floated to their drop sites behind any boat by utilizing an internal, inflatable bladder. This bladder removes the need for any special deployment equipment.

Because concrete companies usually donate waste concrete and diving and fishing clubs help deploy modules, large reefs can be created without straining budgets. These new artificial reefs create new dive and fishing spots and can relieve pressure on existing reefs.

For more information, contact Reef Ball Development Group, 7085 Chap-pell Drive, Doraville, GA, 30360, phone (404) 840-8389, or fax (404) 242-9033.

Coral Reef Biology Seminar

Nekton Diving Cruises will be hosting a week-long Coral Reef Biology seminar aboard the *Nekton Pilot* as she cruises the great barrier reef of Andros, Bahamas. Sponsored by the Marine Science Education Institute and presented by David Wilhelm, marine naturalist and coral reef researcher, this seminar will be offered June 5-12, 1994.

To reserve your place aboard this special cruise contact Nekton Diving Cruises at (800) UW-WORLD or (305) 463-9324.

Humpback Whale Expeditions

The live-aboard dive yacht *Coral Star* has begun annual expeditions to the Silverbank to watch and swim with giant humpback whales.

For the upcoming diving season in the Bahamas Out Islands, particularly Exuma, Conception, San Salvador and Rum Cay, the *Coral Star* has added an E-6 automatic film processing lab. Guidance in movie making and photography is also available from onboard crew.

For more information please contact Herb Lambrechts at (305) 563-1777 or fax (305) 563-1811.

100 PLUS SHARK DIVE

Walkers Cay, a Bahamian island resort, is offering a shark dive experience featuring 100 or more sharks every dive. Developed three years ago, the population of sharks has continued to grow to the point that recently populations exceeded 150 or more individual sharks.

Done daily the dive routinely attracts two species of black tip sharks, bull, grey reef, lemon, nurse and occasionally a hammerhead shark.

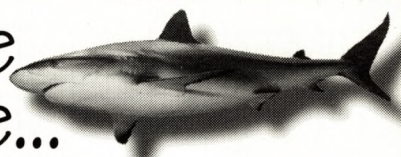
For more information contact Walkers Cay Hotel and Marina at (800) 327-8150.

BAHAMAS DIVE GUIDE

The Bahamas Dive Guide is a comprehensive booklet listing 25 different diving destinations and 1,000 unique dives throughout the nation's 700 islands and cays. Information is also provided on the "Undiscovered Bahamas" — islands located in the southernmost portion of the archipelago including Conception Island, Rum Cay, Crooked Island, Ragged Island, Hogsty Island and Great Inagua.

For more information contact your travel agent or call (800) 866-DIVE. ■

Dive the Wave of the Future...



FREE* INTRO TO NITROX CLASS

*with any package of 3 nights or more!

Here's your chance to step into the future. With enriched air nitrox and your "Introduction to Nitrox" Certification you can actually "ride the diving wave of the future". Diving enriched air



here in the Bahamas gives you more bottom time at our world class diving sites. It gives you access to places others only dream about.

IF YOU ARE ALREADY NITROX CERTIFIED, the mix is on us. The enriched gas for your planned dive is free. Need more information, call us, we are the first International Nitrox Center in the Bahamas #001.

ADVENTURE SHARK ALLEY

How about a visit to Shark Alley! Whew! You can count their teeth you're so close. Within minutes of your arrival, they know... you're there. Soon more sharks are swirling around you, inspecting you, nose to nose.

Honestly, it's a thrill you'll never forget. And you'll appreciate it all the more if you take our Shark Specialty Course, then you will know why they look at you like lunchmeat and appreciate the vital role they play in the ocean's ecology too.

NEW PROVIDENCE ISLAND
NASSAU • BAHAMAS

800-368-3483

FAX: 305/943-5002

**DIVE
DIVE
DIVE
DIVE** Ltd

ANDI • Iantd • NASDS • NAUI • PADI • SSI
Nitrox / Trimix / Air

Free information circle 65 on reader service card

Discover the Out Islands



The Out Islands of The Bahamas...10 Islands, 43 resorts specializing in warm hospitality and service, miles of secluded beaches that are uncrowded and unspoiled with pink and white sand. All this... just waiting to be discovered.



Abaco • Andros • Berry Islands
Bimini • Cat Island • Crooked Island
Eleuthera • Exuma • Harbour Island
Long Island and more...

1-800-OUT ISLANDS (688-4752)

In Fort Lauderdale: 305/359-8099 1100 Lee Wagener Blvd., Suite 206, Fort Lauderdale, FL 33315
Your one-call source for information, rates, diving packages and reservations

Free information circle 80 on reader service card

Dive Log

*A fish of a different color turns out to
be an unusual endemic species*

BY KATHY DEWET



KATHY DEWET

DIVE LOG

Diver: Kathy deWet

Depth: max 100 feet

Dive Boat: M/V Tropical Princess

Date: July 1, 1992

Dive Site: un-named pinnacle

Dive Location: Indonesia

It was my second visit photographing the immense variation of marine species in Indonesia. This pinnacle teemed with hundreds of fish that will forever spoil divers like myself. Cruising over a coral head isolated in the sand at the base of the pinnacle, I spotted a small violet fish whose yellow head looked like a spotlight in the dim surroundings of the deep, blue water. I recognized the fish as belonging to the group commonly called Dotty Backs. The arrangement of the color pattern appeared to be unique. Close observation of the area revealed four or five more fish of the same species. I motioned to divemaster Glenn Barall to come have a look and was encouraged about my find as his strobe began to flash repeatedly. Back aboard the vessel, Glenn and I poured over fish books. No fish like the one I found could be identified with the resources available. The chance of discovering something new excited both Glenn and I. After the trip, we sent the slides off for identification. While learning the fish had been described in 1980 as *Pseudochromis aurifrons*, we also found that ours were the first color photographs of the fish in the wild! It also suggests that this unique little fish we nicknamed the Yellow Capped Dotty Back is an endemic species not occurring anywhere else in the world.

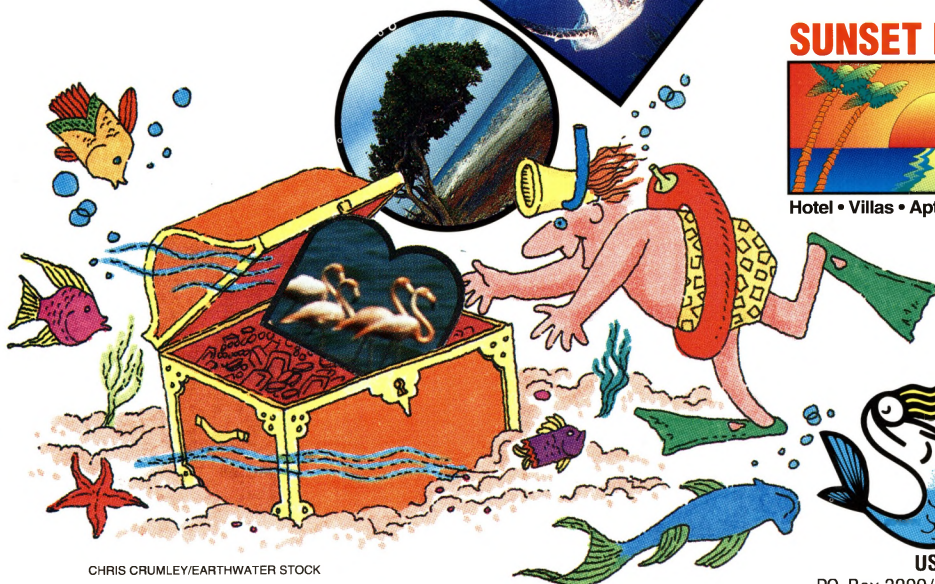
Discover the Real Treasure of Diving... in Bonaire!

Crystal-clear, calm protected waters, teeming with undersea exotic creatures, caverns, walls, coral reefs, and a land of rare animal life, foliage and birds... all in their natural habitat.

Enjoy this affordable and newly refurbished SUNSET BEACH HOTEL vacation facility, including an on-property, fully-equipped dive shop located at Sunset Beach's beautiful sand beach. Our new, exclusive steak house offers prime, imported cuts, and a fun-for-all Karaoke. Relax in the new fresh-water pool and any of the three open-air jacuzzis. Entertainment, sightseeing, sports activities and island shopping are also available.

Take advantage of all that BONAIRE and SUNSET have to offer. Savor forever the real treasure of the island...

The Memories!



CHRIS CRUMLEY/EARTHWATER STOCK



Sunset Beach Hotel

1994 BON-ANZA

\$899⁰⁰

Seven nights, valid
4/15/94-12/14/94.
Travel Mon. thru Thurs.
(add \$39 for Fri., Sat.,
Sun. travel)

Price Includes:

• Roundtrip airfare from Miami to Bonaire

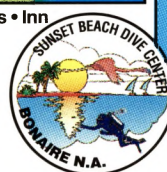
- U.S. Departure Tax
- U.S. Federal Taxes
- Hotel transfers
- Welcome cocktail
- Breakfast buffet daily
- Map of Bonaire
- Bonaire poster
- One day car rental per room
- Six days of diving
- One 1-tank guided boat dive per day
- One boat night dive per stay
- Unlimited airfills for offshore diving
- Use of tanks, weights and weightbelt
- All service charges and taxes

For Non-Diving Companion Deduct \$200 • Upgrade to 12 Boat Dive Package Add \$80. Air Add-on from Atlanta from \$60 per pers. Call for add-on rates from your home city. *Not included:* \$10 Bonaire Departure Tax, \$10 Marine Park Fee and Car Insurance. Prices subject to change and availability.

SUNSET RESORTS



Hotel • Villas • Apts • Inn



Caradonna Caribbean Tours

Scuba Diving Travel Specialists Inc.

Free information circle 39 on reader service card

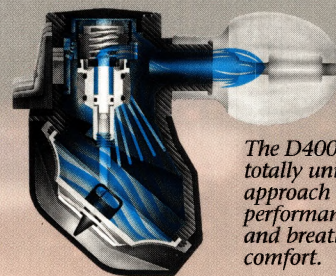
USA & CAN: 800/328-2288 • FL: 800/330-3322

P.O. Box 3299/Longwood, FL 32779 • 407-774-9000/FAX 407-682-6000

Not Everyone Can Handle This Level Of Performance.

The SCUBAPRO D400 second stage isn't for everybody. A total departure from conventional design, the D400's unique shape and souped-up capabilities are for divers who relish the ultimate in performance and breathing comfort.

SCUBAPRO engineers spared no efforts designing the D400 as an ultra high-quality second stage. From hydrodynamic styling that reduces mouth fatigue, to a convenient Dive/Pre-Dive control switch that adjusts with only a



The D400 is a totally unique approach to performance and breathing comfort.

finger-touch, you'll find SCUBAPRO excellence behind every detail of the fully loaded D400. And, of course, your every breath will be crisp and easy regardless of pressure fluctuations.

The D400 is constructed of the finest materials available. A fiberglass-reinforced polyester case makes this second stage incredibly durable, corrosion-resistant, and neutrally buoyant. Plus, the D400 is backed by a worldwide, limited lifetime warranty for your peace of mind wherever you dive.

D400 Systems include either the SCUBAPRO top-of-the-line Mk 15 first stage or the Mk 10 first stage. Call toll-free — 1-800-GO SCUBA — to find the SCUBAPRO dealer nearest you.

SCUBAPRO®

A Division of UNDERSEA INDUSTRIES, INC.
3105 E. Harcourt, Rancho Dominguez, CA 90221
Free information circle 71 on reader service card